MAHILA POLICE OF VADODARA CITY: ASSESSMENT OF NUTRITIONAL STATUS, KNOWLEDGE ON NUTRITION, DIETARY PRACTICES AND IMPACT OF COUNSELLING ON DIETARY PRACTICES

APRIL, 2025

SWETA PATEL

B.Sc. (F.C.Sc.)
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A DISSERTATION SUBMITTED IN PARTIAL FULFILLMENT OF THE REQUIREMENT FOR THE DEGREE OF MASTER OF SCIENCE

(Faculty of Family and Community Sciences)

Foods and Nutrition

(DIETETICS)

BY

SWETA PATEL

B.Sc. (F.C.Sc)

Foods and Nutrition (DIETETICS)

DEPARTMENT OF FOODS AND NUTRITION

FACULTY OF FAMILY AND COMMUNITY SCIENCES,

THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA,

VADODARA, GUJARAT

APRIL ,2025

CERTIFICATE

This is to certify that the research work presented in this thesis has been carried out independently by ***Ms. SWETA PATEL*** *under the guidance of Dr. Hemangini Gandhi in pursuit of Masters of Science (Faculty of Family and Community Sciences) with major in Foods and Nutrition (Dietetics) and this is her original work.*

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Patel

SWETA PATEL

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

ABBREVIATIONS

BMI -Body Mass Index

BSF-Border Security Force

CBI-Central Bureau of Investigation

DBP-Diastolic blood pressure

Hb- hemoglobin

HFSS- High fat, sugar and salt

KAP scores– knowledge attitude practice scores

MDD-W – Minimum dietary diversity of Women

NI – Nutrition incentive

NCD- Non-Communicable Disease

MS-metabolic syndrome

OW-Office workers

Pos-Police Officers

PCOS -Polycystic Ovary Syndrome

SBP-systolic Blood pressure

WHR- waist hip ratio

WSR-waist to stature ratio

GLOSSARY

Anemia- It is a condition characterized by a deficiency in the number of red blood cells or the amount of hemoglobin (a protein in red blood cells that carries oxygen) in the blood, leading to reduced oxygen-carrying capacity.)

BMI- According to the World Health Organization (WHO), Body Mass Index (BMI) is a measure of weight relative to height, calculated as weight in kilograms divided by the square of height in meters (kg/m^2)

Blood pressure (BP) is the force of blood pushing against the walls of your arteries as your heart pumps, typically measured as systolic (pressure during heartbeats) over diastolic (pressure between heartbeats)

CED- According to the WHO, chronic energy deficiency (CED) is a condition characterized by a long-term insufficient intake of calories and/or nutrients, leading to a negative energy balance and often identified by low body weight and low energy stores, with a BMI of less than 18.5 kg/m2 for adults.

Dual burden: The WHO defines the "double burden of malnutrition" as the coexistence of undernutrition (including micronutrient deficiencies) with overweight, obesity, or diet-related non-communicable diseases within the same population, individuals, households, and across the life course

NCD- Noncommunicable diseases (NCDs), also known as chronic diseases, tend to be of long duration and are the result of a combination of genetic, physiological, environmental and behavioral factors.

MDD-W the Minimum Dietary Diversity for Women (MDD-W) indicator, a population-level measure of dietary diversity validated for women aged 15-49, assessing the proportion who consumed food items from at least five out of ten defined food groups in the previous 24 hours.

Anemia- It is a condition characterized by a deficiency in the number of red blood cells or the amount of hemoglobin (a protein in red blood cells that carries oxygen) in the blood, leading to reduced oxygen-carrying capacity.

Overnutrition: The World Health Organization (WHO) defines overnutrition as a form of malnutrition characterized by excessive nutrient and energy intake, leading to abnormal or excessive fat accumulation that impairs health, including overweight and obesity.

Under nutrition There are 4 broad sub-forms of undernutrition: wasting, stunting, underweight, and deficiencies in vitamins and minerals. Undernutrition makes children in particular much more vulnerable to disease and death.

Low weight-for-height is known as wasting. It usually indicates recent and severe weight loss because a person has not had enough food to eat and/or they have had an infectious disease, such as diarrhea, which has caused them to lose weight. A young child who is moderately or severely wasted has an increased risk of death, but treatment is possible.

Low height-for-age is known as stunting. It is the result of chronic or recurrent undernutrition, usually associated with poor socioeconomic conditions, poor maternal health and nutrition, frequent illness, and/or inappropriate infant and young child feeding and care in early life. Stunting holds children back from reaching their physical and cognitive potential.
Children with low weight-for-age are known as underweight.

Abstract

Introduction:

Women police officers in India have a specialized role in addressing crimes and issues related to women and children, such as domestic violence, sexual harassment, and trafficking. They also play a crucial role in facilitating communication between the police and women in the community. So, it's important to improve their nutritional status so that they can work more efficiently and productively.

Objective: The present study was planned with broad objective to assess the nutritional status, knowledge about nutrition, dietary practices and impact of counselling on dietary practices of mahila police of urban Vadodara.

Methodology:

A total of 191 Mahila police were enrolled for the study from 12 police stations in urban Vadodara. The study was divided into 3 phases i.e. phase I-baseline assessment was done in which knowledge on selected aspects of nutrition and dietary practices among Mahila police was assessed. In phase II, out of 12 police station enrolled, 6 were enrolled as control group and another 6 as an experimental group randomly. In all experimental group had 101and control group had 90 mahila police. Sensitization of Mahila police with appropriate IEC material was done for 8 weeks (once a week for 1-2 hours) in experimental group through hybrid mode. After sensitizing them for 8 weeks impact of sensitization among Mahila police was assessed on selected dietary practices.

Findings: Total 191 Mahila police from 12 police stations were enrolled from urban Vadodara for the study. The mean age of the Mahila Police was 32 ± 7.56 years. 41.3% fall under the normal BMI category as per the Asia pacific classification 2007, while 29.8% were overweight, 15.1% were obese, and the remaining 13.6% were chronic energy deficient. Abdominal obesity was found in 36 respondents (19%). The mean hb levels were 10.8±1.47 g/dl with 49% percent mild anemic(10-12g/dl), followed by 43.1% moderately anemic ,3.6% were severely anemic. With regard to knowledge about food and nutrition, only 21.4% had correct understanding of good health at baseline. 90.6% of respondents consumed junk food, with preferences including packed foods (89.5%), fried snacks (87.9%), carbonated drinks (54.9%), and sweets (67%). Minimum

Dietary Diversity for Women (MDD-W) was found to be in 45% of the mahila police as they reported consumption of 5 or more food groups from 24 hr dietary recall in baseline.

A total of 101 Mahila police from 6 police station were given counselling sessions for 8 weeks (once a week for 1-2 hours) through Ppts and training module in hybrid mode.

Post intervention in Phase III, it was reported that 97% started consuming fruits daily which was found to be significant. As significant improvement was observed in knowledge levels of selected aspects of nutrition like understanding of good health, causes and prevention of anemia, risk factors of diabetes etc. In the pre-experimental group, 39.6% of the Mahila police had MDD-W. After the intervention, which improved to 85%, which was significant. The results indicated that 90% of the experimental group did not consume beverages such as tea/coffee with breakfast which was significant. A Significant Reduction in consumption of processed was also reported post intervention. 46.7% in the experimental group who did 30 mins of physical activity such as gym/yoga class regularly. Significant improvement was seen in screen time from >2 hours to 1-2 hours.

Conclusion: From the findings of the current study, it can be concluded that dual burden of malnutrition co-exists in Mahila Police which is a cause of concern. Sensitization on selected aspects of nutrition and dietary practices improved the knowledge on basics of Foods and nutrition, dietary diversity and dietary practices. There is a need for regular Nutrition health education and promotion in the police department to improve quality of life including their nutritional status.

Introduction:

In India, policing falls under the jurisdiction of state governments, as established by the Police Act of 1861.According to the Police Commission, the primary function of the police is to enforce laws, investigate and detect crimes, maintain societal order, and handle various aspects of criminal justice. This mandate is fulfilled by different agencies, including state police forces, the Central Bureau of Investigation (CBI), and the Border Security Force (BSF). The Indian police system is divided into three main categories: state police, railway police, and central police.

State police forces are responsible for upholding law and order and protecting citizens' rights within their states. Each state government oversees its own police force, which is organized into districts, each with its own police department. Recently, the role of the police has broadened beyond traditional law enforcement to include crucial services, especially during the ongoing pandemic.

The Indian police system has faced criticism for its heavy workload, with each police officer responsible for an average of 858 individuals, according to the India Justice Report 2020. This figure represents only a modest improvement of 75 individuals compared to the India Justice Report 2017. Concerns about inefficiency and instances of excessive force have also been raised. In response, the Indian government has launched initiatives aimed at modernizing the police system. These efforts include adopting new technologies, improving training and equipment, and implementing reforms to boost accountability.

Implementation of a physical fitness program, as well as a proper diet, can extend the career and improve the life of officers. In addition, the department will benefit in the public's eyes by producing more professional and impressive looking officers that will help to combat the negative stereotype of the out of shape donut eating officer.

It has been shown repeatedly that everyone, including police officers, can reduce their stress levels through physical exercise, relaxation techniques and good nutrition. The relation between physical fitness and nutrition and general well-being has long been known.

For instance, according to the President's Council on Physical Fitness and Sports (2004), four pillars have been identified as vital for improving the health and fitness of Americans: 1) being physically active everyday 2) Eating nutritious foods 3) Getting preventive screenings and 4) Making healthy choices/Avoid risky behaviors. The health consequences of a poor diet and

physical inactivity can result in a chronic disease or Health conditions such as: Heart disease, High blood pressure, Type 2 diabetes, and various cancers - including colon cancer, Stroke, Chronic pulmonary disease (bronchitis, emphysema, and asthma), anxiety and depression (President's Council on Physical Fitness and Sports, 2004).

Women Police

The integration of women into the Indian police system is relatively recent compared to other countries. The need for female police personnel became apparent during the 1938 labor strike in Kanpur, where controlling women workers was challenging. Consequently, women were recruited into the Kanpur police force in 1939 (Mahajan, 1982), although more sustained efforts were needed. The Delhi Police was the first to regularly enlist policewomen in 1948 (Suvarna Joshi, 2015).

During the colonial period, the British established the All-India Women's Conference with the goal of improving women's status in India. This conference aimed to provide women with educational and employment opportunities, including positions in the police force. Consequently, early 20th-century female police officers were trained to address issues related to women and children, gradually earning recognition for their contributions.

After India gained independence in 1947, the government took steps to increase the participation of women in policing. In 1965, the Central Reserve Police Force (CRPF) set up a dedicated women's unit, and by the 1970s, most state police forces had followed suit. The 1980s and 1990s saw the introduction of affirmative action policies to boost women's representation in the police force.

Today, women police officers play a vital role in the Indian police system, with their numbers steadily growing. They handle a range of responsibilities, including crime investigation, maintaining law and order, and managing cases involving women and children as victims. The inclusion of women in the police force has not only enhanced women's status in Indian society but has also contributed to the modernization and improvement of the police system.

The Bureau of Police Research & Development (BPR&D, 2017) highlights the importance of having a sufficient number of women in the police force to help reduce women's vulnerability to crime. However, the current ratio of women police personnel remains low, at just 10%. This underrepresentation poses significant challenges in tackling crimes against women and managing

female offenders. To address these issues effectively, it is essential to increase the presence of women police officers both at the front lines and in higher ranks.

2013: The percentage of women in the police force was 5.87%.

2017: The percentage of women in the state police force was 7.28%.

2021: The percentage of women in the state police force was 10.47%.

2022: The percentage of women in the police force was 11.75%.

The roles, functions, and responsibilities of female police officers in India are largely similar to those of their male counterparts, though there are some notable distinctions.

Functions include:

1. Enforcing laws and maintaining public order.
2. Investigating crimes and making arrests.
3. Ensuring public safety and maintaining peace.
4. Managing traffic.
5. Assisting victims of crimes and accidents.
6. Engaging in community policing and outreach activities.

Duties:

1. Patrolling designated areas to uphold law and order.
2. Investigating crimes, including interviewing witnesses and gathering evidence.
3. Responding to emergency calls and providing aid to citizens in need.
4. Conducting raids, searches, and making arrests.
5. Keeping records and preparing reports on incidents and investigations.
6. Handling complaints received on the 1091 emergency line.
7. Overseeing the Women Help Desk at all police stations.

In addition to these general responsibilities, female police officers in India have a specialized role in addressing crimes and issues related to women and children, such as domestic violence, sexual harassment, and trafficking. They also play a crucial role in facilitating communication between the police and women in the community. Overall, the role of female police officers is to ensure the safety and security of citizens, foster community policing, and uphold the law.

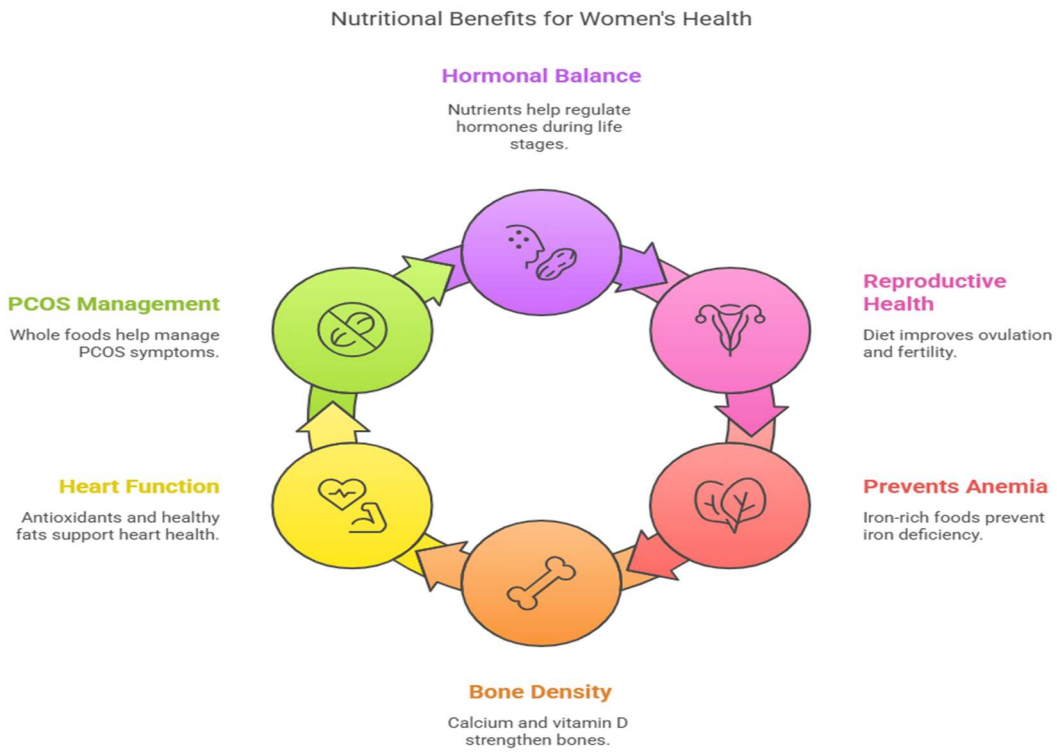
So, it's important to look after their nutritional status and dietary part so that they can work more efficiently and productively, which will help to strengthen the country and also, they can look after their professional and personal life in a much better aspect.

Research suggests that having women in the police force can have benefits, such as: Ensuring the interests of the public, demonstrating a commitment to equal opportunity, Improving the public image of the police, Building better relationships with communities, and enhancing an ethic of care.

Importance of better Nutrition in Women:

Nutrition is important for everyone, but women have their specific biological concerns and life stages which put them at a much higher risk.

Figure 1.1 Nutritional benefits for women's health



1. Hormonal Balance

Women go through a number of stages in their life when their hormones may fluctuate like during puberty, periods, pregnancy, or even menopause. Healthy fats, protein, fiber, and vitamins B6,

magnesium, and omega 3's are very instrumental in helping to maintain balance and regulate hormones over prolonged periods of time.

2. Improves reproductive health and Fertility

Adapting the right diet may allow better and easier ovulation as well as assist in enabling better menstrual health. In addition, it also aids in strengthening the chances of pregnancy by providing necessary antioxidants which safeguard eggs from oxidative stress therefore improving fertility.

3. Prevents Iron deficiency & anemia

Menstruation makes a lot of women lose iron. Fortunately, incorporating iron rich foods like spinach, lentils, or fish as well as vitamin C shields women from the threat of anemia.

4. Strengthens Bone Density

Weaker bone density along with menopause can expose women to a higher chance of osteoporosis. A sturdy bone structure can be achieved with sufficient intake of calcium, vitamin D, and magnesium.

5. Better Heart Functionality

While estrogen does assist with protecting heart, the best form of backup comes from a diet that's rich in fiber, healthy fats, and antioxidants.

6.Copes with PCOS (Polycystic Ovary Syndrome)

PCOS is a common condition among women, leading to weight gain, hormonal imbalances, and issues with insulin. Whole foods with high content of fiber and lean meat in addition to decreasing processed foods assist in easing the medical condition.

7.Improves Mental Health and Mood Stability

Women are more prone to anxiety and depression due to hormonal changes in the body.

Probiotics, B vitamins, omega 3 fatty acids, and magnesium helps in brain functioning and regulating of the mood.

8.Ensures a Healthy Pregnancy and fetal development

Pregnant women greatly benefit from nutrients such as folate, iron, calcium and omegas- 3 for better pregnancy outcomes.

Appropriate nutrition lessens the chances of complications such as gestational diabetes or preeclampsia.

9.Helps ease menopause symptoms

Soy, flaxseeds, phytoestrogens, calcium and Vitamin D along with magnesium takes charge for managing hot flashes, bone loss and mood changes. During this phase, hydration and fiber helps in digestion and metabolism.

10.Strengthens Immunity and Longevity

Pouring Zinc, probiotics, antioxidants (vitamins C, E and A) into the diet shields the body and lowers the chances of falling ill. Chronic illness is facilitated by an unhealthy diet while a balanced one brings longevity.

Good nutrition isn't just about looking fit—it's essential for every stage of a woman's life, from adolescence to menopause and beyond. A balanced diet ensures better energy, mood, reproductive health, and long-term well-being.

IMPORTANCE OF NUTRITION IN MAHILA POLICE:

Nutrition is essential for the health and well-being of female police officers in India. As frontline law enforcement personnel, they encounter unique challenges and demands that necessitate optimal physical and mental fitness. Here's why proper nutrition is crucial for them:

1. Physical Fitness: Female police officers must maintain high physical fitness levels to perform their duties effectively, which often involve physical exertion, endurance, and agility. A balanced diet provides essential nutrients, vitamins, and minerals needed for muscle strength, energy production, and overall physical health. Good nutrition supports optimal body composition, bone health, and cardiovascular health, reducing the risk of injuries and enhancing performance.

2. Mental Health and Cognitive Function: The nature of police work, with its high-stress situations, long hours, and exposure to trauma, can affect mental health and cognitive abilities. A well-balanced diet rich in vitamins, minerals, and omega-3 fatty acids supports brain health, cognitive function, and emotional well-being. Nutritional deficiencies can lead to increased stress, fatigue, mood swings, and decreased concentration, negatively impacting mental health and job performance.

3. Immune Function: A strong immune system is vital for female police officers to fend off diseases and stay healthy. Nutritional deficiencies can weaken immunity, making them more

susceptible to infections. A diet rich in fruits, vegetables, whole grains, and lean proteins provides essential vitamins, minerals, and antioxidants that bolster immune function, helping officers remain resilient and healthy.

4. Overall Well-being and Quality of Life: Proper nutrition is key to promoting overall well-being and enhancing quality of life. A nutritious diet helps maintain a healthy body weight, reduces the risk of chronic diseases such as diabetes, cardiovascular diseases, and certain cancers, and improves energy levels, sleep quality, and mood. This contributes to a higher quality of life and better overall health.

Given the physical and mental demands of their roles, female police officers in India would benefit significantly from access to healthy and nutritious food options, nutrition education programs, and workplace initiatives that support their dietary needs.

Focusing on nutrition can enhance the overall health, performance, and well-being of female police officers, ensuring they are well-prepared to serve and protect their communities effectively.

The unique nutritional needs of women police in India are influenced by the physical and mental demands of their job, as well as cultural and regional factors.

1. **Physical Demands**: Women police officers often engage in physically demanding tasks such as patrolling, chasing suspects, and handling emergencies. This requires a diet rich in protein, carbohydrates, and healthy fats to maintain energy levels and muscle strength.
2. **Irregular Work Hours**: The nature of police work often involves irregular and long hours, which can disrupt regular meal patterns and lead to unhealthy eating habits. Ensuring access to nutritious snacks and meals is crucial for maintaining energy and focus.
3. **Mental Resilience**: The job can be mentally taxing, requiring high levels of stress management and mental resilience. A diet rich in omega-3 fatty acids, antioxidants, and B vitamins can support brain health and emotional well-being.
4. **Cultural and Regional Factors**: In India, traditional dietary practices and regional foods can play a role in meeting nutritional needs. Incorporating locally available nutritious foods can help in maintaining a balanced diet.
5. **Government Initiatives**: Programs like the Poshan Sudha Scheme aim to improve the nutritional status of women, including those in law enforcement. This scheme provides

meals, iron and calcium tablets, and health nutrition education to pregnant and lactating mothers.

Some challenges and considerations specific to women police to assess the nutritional needs:

Work-Related Stress: According to a study International Journal of Research Publication and Reviews, women police officers in Gujarat reported high levels of work-related stress due to the demanding nature of their job. Women police officers often face high levels of stress due to the nature of their job, which includes dealing with emergencies, crime scenes, and potentially dangerous situations. This stress can have significant impacts on their mental and physical health.

Irregular Work Hours: The irregular and long hours associated with police work can disrupt regular meal patterns and sleep schedules, leading to unhealthy eating habits and fatigue.

A report by the Bureau of Police Research and Development highlighted that irregular work hours are a significant challenge for women police officers, affecting their nutritional status overall well-being and performance.

Physical Demands: Research published in the International Journal of Applied Research noted that the physical demands of policing are often perceived as a barrier for women, despite their capabilities. The physical requirements of police work, such as patrolling and handling suspects, can be challenging for women, especially if they are not provided with adequate training and support.

Balancing Work and Family Responsibilities: According to a study by the International Journal of Pure and Applied Bioscience, women police officers in Hubli-Dharwad reported difficulties in balancing work and family responsibilities, which impacted their overall well-being. Women police officers often struggle to balance their work responsibilities with family obligations, which can add to their stress and affect their performance and nutritional status and requirement

Factors influencing nutritional knowledge in women police,

Education: A study by Muragod and Chimmad (2018) found a strong positive association between educational qualification and nutritional knowledge among women police in Hubballi-Dharwad. Higher levels of education are often associated with better nutritional knowledge. Women with higher educational qualifications tend to have a better understanding of nutrition and its impact on health.

Training: The same study by Muragod and Chimmad (2018) highlighted the importance of training in improving nutritional knowledge among women police.

Regular training programs and workshops on nutrition can significantly improve nutritional knowledge. Police departments that emphasize nutrition education in their training programs tend to have officers with better nutritional knowledge.

Cultural Beliefs: Cultural beliefs and practices can influence dietary habits and nutritional knowledge. Traditional dietary practices and regional foods can play a role in shaping nutritional knowledge. The study by Muragod and Chimmad (2018) also noted that cultural factors can impact the nutritional knowledge and dietary practices of women police.

Access to Resources: Access to nutritional resources, such as healthy food options and nutrition education materials, can enhance nutritional knowledge. Police departments that provide access to these resources can help improve the nutritional knowledge of their officers. Research by the Bureau of Police Research and Development suggests that providing access to nutritional resources can improve the overall well-being and performance of women police officers.

Peer Influence: The influence of peers and colleagues can also play a role in shaping nutritional knowledge. Women police officers who are surrounded by colleagues with good nutritional habits are more likely to adopt similar practices. A study by the International Journal of Pure and Applied Bioscience found that peer influence can impact the dietary behaviors and nutritional knowledge of women police officers.

<u>Some common dietary practices and trends among women police,</u>

1. **Meal Skipping**: Due to irregular work hours and busy schedules, women police officers often skip meals, particularly breakfast. A study by Muragod and Chimmad (2018) found that a significant number of women police officers in Hubli-Dharwad reported skipping meals, especially breakfast, due to their demanding work schedules.

2. **Breakfast Skipping**: Skipping breakfast is a common trend among women police officers, which can negatively impact their energy levels and overall health. The same study by Muragod and Chimmad (2018) highlighted that breakfast skipping was prevalent among women police officers, affecting their nutritional intake and performance.
3. **Reliance on Fast Food**: Due to time constraints and the need for quick meals, women police officers often rely on fast food and convenience foods. Research by the International Association of Chiefs of Police (IACP) noted that law enforcement personnel, including women police officers, often turn to fast food due to their busy schedules and irregular meal times.
4. **Hydration Practices**: Proper hydration is crucial for maintaining energy and focus, but women police officers may struggle to stay adequately hydrated due to their demanding work environment. A study by the International Association of Chiefs of Police (IACP) emphasized the importance of hydration for law enforcement personnel and suggested that busy schedules and shift work can make it challenging to maintain proper hydration practices

These dietary practices and trends highlight the need for targeted interventions and support to improve the nutritional habits of women police officers.

Malnutrition in women of Reproductive age (15-49 yrs)

India: Nutritional status of women

According to NHFS-5 data factsheet, 18.7% of women has BMI Below than normal (BMI<18.5kg/m2).24% of women are overweight or obese with BMI >-25kg/m2.Women with 56.7% have high risk waist to hip ratio (>0.85).

Anemia: Fifty seven Percent of women in India are anemic, Anemia is particularly high among rural women than urban women. Twenty-six percent of women are mildly anemic, 29 percent are moderately anemic, and 3 percent are severely anemic.

Hypertension

Twenty one percent of women age 15 and over have hypertension, including 12 percent with mildly elevated blood pressure, 4 percent with moderately elevated blood pressure, and 2 percent with severely elevated blood pressure. Forty-four percent of women have blood pressure within the

normal range. Almost two-fifths (39%) of women are pre-hypertensive. One percent of women are currently taking antihypertensive medicine and have their blood pressure in the normal range.

Diabetes

Six percent of women age 15 and over have a high blood glucose level (141-160 mg/dl), and an additional 6 percent have a very high blood glucose level (more than 160 mg/dl), for a total of 12 percent of women whose blood glucose level exceeds 140 mg/dl. One percent of women, have a normal blood glucose level and are taking medicine to lower their blood glucose level

Tobacco and alcohol use:

Four percent of women age 15-49 use some form of tobacco. Among women, the most common form of tobacco used is chewing paan masala or gutkha, chewing paan with tobacco, and using khaini (1%). Only 1 percent of women drink alcohol Among women who drink alcohol, 17 percent drink alcohol almost every day and 37 percent drink alcohol about once a week.

GUJARAT: Nutritional status of Women

According to NHFS 5 Data Sheet,

23% of women are overweight or obese, whereas 25% percent of women in Gujarat are too thin. Over half of women (52%) are at healthy weight for their height. More than two fifth (44%) of women have a waist to hip ratio that put them at risk of metabolic complications. The proportion of adults with an increased risk WHR increases with age, from 35% for women age 15-19 to 52% for women age 40-49. The proportion of women having a substantially increased WHR is much higher in urban areas (47%) for women than in rural areas (41%).

Anemia:

65% of women in Gujarat have anemia, including 26% with mild anemia, 35% with moderate anemia, and 4% with severe anemia. Anemia is particularly high among rural women, women age 15-19, and scheduled tribe women, but anemia is 59 % or more for every group of women. Anemia among women has increased by 10 % points since NFHS-4

Diabetes and other diseases.

According to self-reports, 1337 women per 100000 have diabetes. Overall, 1004 women have asthma. The prevalence of any heart disease is lower among women (352 per 100000) than among

men. Among the five diseases, cancer is the least common, with 173 women per 100000 reportedly having cancer.

Blood pressure(hypertension)

% of women age 15-49 in Gujarat have hypertension, including 7 percent with Stage 1 hypertension, 2 percent with stage 2 and 1 percent in stage 3 hypertension. Hypertension includes women with normal blood pressure who are taking medicine to lower their blood pressure. 56% of women have normal blood pressure.

Blood glucose

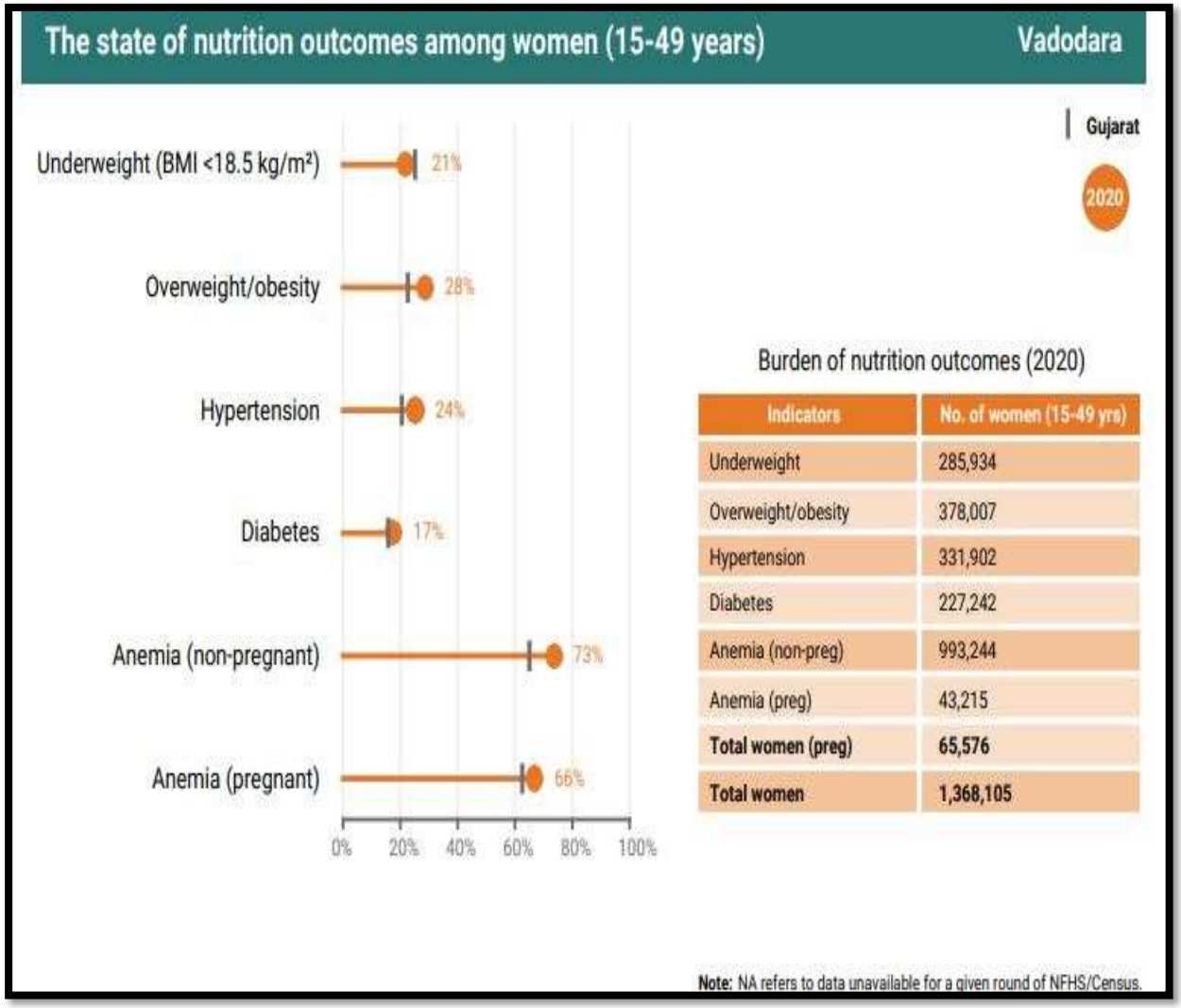
In Gujarat, 6% of women age 15-49 have high blood glucose levels and 4% have very high blood glucose levels.10% of women have blood glucose levels more than 140 mg/dl and are taking medicine to lower their blood glucose level.

Tobacco and alcohol use:

Only 6% of women, age 15-49 use some form of tobacco. Use of any form of tobacco is slightly higher in rural areas than urban areas. In urban areas 0.1% women drink alcohol.

State of nutrition outcomes among women(15-49 years) in Vadodara city

Figure 1.2 Nutritional outcomes among women



Source- IFPRI district nutrition profile

Nutritional status of working women in India and Gujarat:

Agrawal et al., (2015) emphasized that women's work participation, their income and autonomy over the household income alone not guarantee the nutrient intake and health status. Women's employment along with education is the major mean to improve the nutrition and health. There is need to emphasize to increase her knowledge about the nutritional needs and balanced diet which will empower her to take better decision in favor of not only her nutrition and health but also for her family. In addition to this, it is essential to foster the concept among women of improving

nutrition for their own health rather than for their family or children sake. It also suggests that there is also need to study the effects of varied occupations environment on the health and nutritional status of woman where she is working in Indian scenario because more awareness will significantly have better nutrition knowledge, food habits, self-concepts and better health.

Patel et al., (2016) indicated coexistence of obesity and under-nutrition in women of semi-urban region of Gujarat. These dual nutritional health problems are developing specially
in urbanizing areas of our country.

Mishra S and Gehlot S (2025) opined that majority of the working women are in the normal range of BMI. More than one third of working women are overweight. Fat intake of working women is on higher side. At the same time the consumption of fruits also found higher when compared to other research findings. Approximately one fifth of working women skip their breakfast which when compared to previous researches is less. Overall, the increasing rate of the BMI and fat consumption are the matter of concern. Healthy eating and lifestyle choices are the key factors in making working women's life balanced and healthy.

Pallavi et al., (2020) in her study carried out on assessment of nutritional status and nutritional knowledge of working women residing in the hostels at Mysore city. Almost 150 samples were taken from four different hostels. The majority of the respondents had high knowledge about a balanced diet also, health status which helped them to keep normal BMI. Analyzing on anthropometry methods a total of 76% of the respondents were under high disease risk condition in waist-hip ratio, 13% were at elevated risk and 11% was reduced risk condition. The nutrient intake of calories, protein was less than RDA but the intake of fat and calcium was more than RDA among the respondents. From the study it can be concluded
that, though the subjects were staying in hostel, they had sound knowledge on nutrient intake and balanced diet. Continuation of the study can be conducted to educate them about importance of nutrients and help them to reduce the high risk of diseases.

Mathur et al., (2015) identified that few women (14%) of Bangalore call centre were obese and 50 % women working at Mumbai call centre were overweight. 60-68% women of Ahmedabad and

Noida had normal weight, thus had normal nutritional status. Most of the respondents, irrespective of the city where they live 72% consume only 2-3 serving of meals per day. One fourth of them consume 4-5 serving of meals per day. Overall milk consumption was also low as per the recommended allowances. 46% did not consume milk in the whole day. Consumption of salad and fruits was also very low. Only 30% and 33% consumed salads and fruits in a day. When the diet of women working at call center was analyzed on the basis of food groups it was found that cereal group or carbohydrates consumption was very high, pulses was also more, vegetable and fruits consumption was less, milk and milk products was also low and junk food consumption was high. Tea/Coffee was highly consumed by almost all women. Most of the respondents were obese and overweight. Therefore, it can be concluded that there is a great need of intervention for nutritional counseling and if possible, a canteen should be attached to all call centers which provide food which is hygienic and nutritionally rich and balanced.

Jain and Singh (2003) presented a paper on working women that shows the mean nutrient intake was significantly higher than the recommended dietary allowance. Energy expenditure decreased with increase in age as the subjects had reduced physical activity as they become older. A positive correlation was observed between energy intake and BMI in all age groups. It is concluded that women in sedentary jobs expend lower levels of energy, have higher energy intake, and higher prevalence of obesity with increase in morbidity.

In the view of above, the present study was planned with the following rationale and objectives

Importance of Nutrition health education on changes in dietary practices

Improved Knowledge and Attitudes:

- Enhanced understanding of nutrition:

Nutrition education empowers individuals to understand the importance of different nutrients and how they contribute to overall health.

- Positive attitude towards healthy eating:

Education can foster a positive attitude towards healthy food choices and eating habits, leading to better adherence to dietary guidelines.

- Increased awareness of health risks:

Individuals become more aware of the link between diet and chronic diseases, motivating them to make healthier choices.

Health Benefits and Disease Prevention:

- Reduced risk of chronic diseases:

A healthy diet, promoted through nutrition education, can significantly reduce the risk of developing chronic diseases like heart disease, diabetes, and obesity.

- Improved infant, child, and maternal health:

Better nutrition, facilitated by education, leads to improved health outcomes for infants, children, and mothers, including stronger immune systems and safer pregnancies.

- Enhanced cognitive function and learning:

A healthy diet supports optimal brain function and cognitive development, leading to improved learning and academic performance.

- Reduced risk of malnutrition and micronutrient deficiencies:

Nutrition education can help individuals understand the importance of consuming a balanced diet to prevent malnutrition and micronutrient deficiencies.

- Improved oral health:

A healthy diet, as taught through nutrition education, can contribute to better oral health and reduce the risk of dental problems.

- Increased longevity:

A healthy lifestyle, including a balanced diet, can contribute to increased longevity and a higher quality of life

Rationale of the study:

Women have to strike balance in both workplace and at home so they have to be nutritionally, mentally and physically fit so they can work more efficiently and productively.

There is limited data on nutritional status, knowledge and practices about food on mahila police at regional level.

Therefore, the present study is planned with broad objective to assess the nutritional status, knowledge about nutrition, dietary practices and impact of counselling on dietary practices of mahila police of urban Vadodara.

Specific Objectives:

- To assess the background information of mahila police from selected police stations of urban Vadodara.
- To assess the anthropometry based nutritional status of mahila police and prevalence of anemia (secondary source) in mahila police
- To assess the knowledge on selected aspect of nutrition and dietary practices of Mahila police.
- To conduct counselling sessions for 8 weeks (once weekly for 1-2 hrs with IEC material) to Mahila police of enrolled police station of Vadodara.
- To see the impact of sensitization on mahila police for changes in their dietary practices.

REVIEW OF LITERATURE:

The nutritional status of women police officers is a critical area of study, given the demanding nature of their job and the unique challenges they face in maintaining a balanced diet. This review aims to explore the existing literature on the assessment of nutritional status, knowledge on nutrition, dietary practices, and the impact of counseling on dietary practices among women police officers.

Nutritional status is a comprehensive measure that includes dietary intake, nutritional knowledge, and overall health outcomes. Understanding the nutritional status of women police officers is essential for developing targeted interventions to improve their health and performance. Research has shown that dietary practices are influenced by various factors, including knowledge of nutrition, access to healthy food options, and workplace environment (Adeleye Adeomi,2020).

Counseling has been identified as a potential strategy to improve dietary practices among women police officers as per a study done in Varanasi district (Rai and Arcahana,2023). Studies have demonstrated that nutrition education and counseling can lead to significant improvements in dietary habits and overall health. However, there is a need for more research to understand the specific impact of counseling on the dietary practices of Mahila police officers.

Women have to strike balance in both workplace and at home so they have to be nutritionally, mentally and physically fit so they can work more efficiently and productively.

Review of literature for the current study is presented in following sections

1.Nutrition and health problem of women of reproductive age group

2.Nutrition and health challenges faced by working women

3.Nutrition and health related studies among Police force

4.Impact of NHE on dietary practices

Nutrition and health problem of women of reproductive age group

Global scenario

Miriti N (2022) studied Dietary Intake and Nutritional Status of Women of Reproductive Age: A Case of Sokoni Ward Kilifi County in Nepal. The findings of the study were majority (49%) of women had attained primary education and 48.4% did not attain formal education. Majorities (79%) were married and the average household size was 5-7 persons (60%). Majority (58%) of participants were housewives with 22% as traders and 14% farmers. Majority of women were underweight (67%) while the majority consumed carbohydrates foods at 51.4% protein was consumed at 30%, fruits at 30% and vegetables at 53%. The study concludes that the study participants had poor dietary habits and poor nutritional status. They also were deficient in educational status and had unreliable economic activities. There is need to front nutrition education for women of reproductive age and also encourage them to take an active role in economic activities to ensure food security and well-being of such women

Chhetri et al., (2019) conducted a study on Dietary Intake Pattern and Nutritional Status of Women of Reproductive Age in Slum Areas of Pokhara Metropolitan in Nepal which revealed that 99% of the participants consumed starchy staple foods daily, while 56.7% ate vegetables daily, and nearly half frequently consumed prepackaged foods and soft drinks. Age, occupation status, and frequency of food consumption were the key predictors of being underweight, and age, knowledge regarding nutrition, and frequency of meals were the key predictors of being overweight. Developing countries must emphasize the importance of considering these factors in public health interventions and strategies aimed at promoting healthy weight management.

Timilsina et al., (2011) conducted a study on Factors associated with nutritional status of women of reproductive age group in rural, Nepal which states that Women of all age groups were vulnerable to undernutrition. There was an indication of insufficient food availability at the household level. 22.7% of the study population reported of food inadequacy. Educational status and marital status were statistically significant in the determination of nutritional status. The study showed that the nutrition status of the study population in Shree Kedar VDC was poor. Food inadequacy, inadequate information/knowledge, low educational levels, caste, income, and family

size were the key contributors to poor nutritional status. Furthermore, nutritional interventions are highly needed to improve the nutrition status of women.

National scenario

Sahu et al., (2011) conducted a study on Nutritional status of reproductive age group women: A community-based study in Maharashtra. In this study, 75% of women were suffering with anemia, mostly mild and moderate grades of anemia. Women with early age of marriage before 18 years had a significantly higher prevalence of anemia as compared to those married after 18 years. Sociodemographic variables like age, age at menarche, duration of marriage, and no. of children had shown no relation with anemia. A significantly lower number of women with the weight of more than 50 kg and a BMI of more than 25 had anemia. Nutritional status has a significant effect on the grade of anemia. Women of reproductive age groups are affected by anemia irrespective of age and parity.

Venkatesh et al., (2017) evaluated Nutritional assessment of women in the reproductive age group (15-49 years) from a rural area, Kolar, Kerala, India which states that out of 180 women, 49 (27.2%) of the women were overweight and 26 (14.4%) women were underweight. 36.67% women had a waist hip ratio of more than 0.85. Multivariate logistic regression showed that Age and educational status were independent risk factors for increased Waist Hip Ratio among women in reproductive age group. Higher prevalence of overweight and abdominal obesity was observed among women of reproductive age group in rural area. Hence measures to improve the nutritional status of women in rural areas need to be addressed.

Arlappa et al., (2022) opined Diet and Nutritional Status of Women of Reproductive Age (15–49 Years) in Indigenous Communities of Attappady in Kerala that the diet was primarily based on cereals and root-based starchy staples, with low consumption of dairy products, fruits, and vegetables. The estimated intakes of major nutrients, except for protein, were lower than the recommended dietary allowance (RDA). Nearly 50% of the WRA were malnourished. About 32% of non-pregnant and non-lactating (NPNL) women and 40% of lactating mothers suffered from chronic energy deficiency (BMI < 18.5 kg/m2). Conversely, 13.4% of NPNL women and 15% of lactating mothers were overweight or obese (BMI ≥ 25 kg/m2). A total of 12.5% of adolescent girls aged 15–19 were thin (BAZ < −2 SD), and 10.5% were overweight or obese (BAZ > +1 SD). Since the co-existence of micronutrient deficiencies and undernutrition is rooted in the socio-

cultural aspects of indigenous tribes, a culturally sensitive nutrition intervention model would be appropriate for the better health and wellbeing of women in the community.

Prasad, R. (2022-23) evaluated Nutritional Status among Women in India: A Comparative Assessment of Bihar and Maharashtra States. The study concludes that the burden of overweight or obesity due to increasing sedentary lifestyles and junk food habits, especially in urban and economically sound areas, is alarming. Prevention and control of this serious problem through awareness programmes to adopt diversified nutritional food and a healthy lifestyle are strongly recommended

Dey et al., (2024) studied Prevalence and determinants of malnutrition among women of reproductive age in Bangladesh. The prevalence of overweight and obesity status was higher for women who were urban residents, lived in the Chattogram division, and completed secondary education. Moreover, the respondents who were not involved in the workforce, were exposed to mass media, came from rich households whose husbands had above secondary education and were involved in business, had one or two children, and had a higher age gap between spouses also had a higher risk of being overweight and obese. Effective prevention and control programs should be implemented to target women with a higher risk of developing the disease to reduce the prevalence of malnutrition.

Regional

Rathod et al., (2013) conducted a study on an Assessment of Dietary Practices of Reproductive Age Group Women based on Their Hb Status in Jamnagar City, Gujarat, India. The findings of the study were (67%) patients were found to be having iron deficiency anemia in various age groups. Results also showed that dietary habit of patients was one of the major causative factors leading to iron deficiency anemia. To overcome iron deficiency anemia a thorough and comprehensive strategy is required, i.e., educating the subjects to consume food rich in iron, community-based program, monitoring severely anemic cases and their treatment.

Yagnik et al., (2014) conducted a study on Nutritional Status Assessment of Women from Different Occupations in Urban and Semi-Urban Regions of Gujarat. The findings revealed that coexistence of obesity as well as under-nutrition in semi-urban region of Gujarat. These dual nutritional health problems are developing specially in urbanizing areas of our country, thus

detailed studies are required for better understanding of the causative factors like behavioral, socio-cultural and environmental which influence these conditions

Nutrition and health challenges faced by working women:

Vaishnav, S. (2016) conducted a study on Perception of Nutrition among Working Women: An Observation in urban areas of Ahmedabad. Which states that the women are now becoming more concerned about understanding their health issues and nutrition as they are essential member of the home as well as workplace. They understand the value of maintain healthy lifestyle through healthy eating habits. The economic status plays important role in sustaining the healthy life style. The healthy eating habits and life style necessarily does not depend on economic status and high earning. Healthy eating habits depends on the perception of the nutrition which may vary according to their perception and value to nutrition in life

Women have various responsibilities and as working women, they have to manage their work life and personal life **(Anju katewa, 2018**). The aim of this study was to learn about the nutritional status of working women in Hisar, Haryana. From various areas, such as bankers, doctors, college professors, and school teachers, 50 women were selected from each sector. A total of 200 working women were chosen for the study. A purposive sampling technique was in use for sample selection. To measure their nutritional status, their BMI was calculated. The data reflects that 54% of working women were under the normal weight range. But 24% of women were overweight. Although it showed that they have good knowledge of nutrition.

The analysis was undertaken to gain knowledge about dietary pattern and stress level among working women in Coimbatore **(Lakshmi Praba, 2021**). For that age group of 25 to 40 years aged 100 working women were selected randomly. Data collection was done by interview method. 28% of women were overweight and 28% were obese, only 6% of women were underweight and 38% were normal BMI. Moreover, findings showed that women were having deficiency of intake of energy, protein, fiber, iron and calcium. Fat intake was higher in women. 72% of women feel stressed and 28% women were feeling high stress. Conclusion of this study was that stress level is high and nutritional status is low. There is no relationship between nutrient intake and stress level

This study was conducted to learn more about the eating habits of working women in the Himachal Pradesh district of Hamirpur **(Bharti, 2018**). This study also exposes eating habits and practices that affect the nutritional status and general health of working women. 50 women were chosen to participate in the study. Purposive sampling was employed for the study. Semi-structured questionnaires were employed to collect the data, and the 24-hour recall diet approach was applied. According to the study's findings, 74% of women were vegetarians. Women commonly believed vegetarian food to be healthier than non-vegetarian meals. The results of this study showed that lower socioeconomic working-class women had a poor nutrient intake of food in their diet, consuming little fruits, fats, and energy

Shafi Syeda and Sultana Nuzhat (2022) reported about the Nutritional Status of Working and Nonworking Women. The findings of the study were most of the time women who take care the health & nutrition of whole family, but ignores her own. Therefore, awareness regarding food habits is essential in both i.e. working and nonworking women. The study also concluded that it should be necessary to educate the both working and non-working women about importance of nutrients and help them to reduce the high risk of disease.

Nandhini J and Sheeba M.K (2022) conducted a Comparative Study on Health Status of Women Working in Day and Night Shifts of IT Companies in Coimbatore which states that at there is a noticeable improvement in the nutritional knowledge of day shift and night shift subjects due to nutrition education programs. This study also explores that the monotonous tasks women had to encounter every day in their work place lead them to face many health-related problems. And so, adequate energy, protein, fat, calcium, iron and vitamin-C should be provided to maintain normal health and to prevent health complications. In particular, physio-psycho problems are high among women employees of corporate companies. So that they should widen the concept about their diet in a holistic way by incorporating rainbow diets in their food through supplements and regular exercises like yoga, meditation should be followed to overcome their day-to-day stress and to stay healthy and fit.

Gajjar N (2021) conducted a study on Anthropometry based nutritional status and dietary pattern of working adults of Gir Somnath District, Gujarat. It states that Dual Burden of Mal Nutrition

was found in working adults of Veraval urban. Also their dietary practices were poor. There is a need for sensitization of people in workplace setting on healthy diets.

Nutrition and health related studies among Police force

Global scenario

Guffey J (2011) studied Police officer fitness, diet, lifestyle and its relationship to duty performance and injury in California. One hundred seventy-three male officers participated in the study (79.7%), and 44 female officers (20.3%). The combined mean number of hours per week for both aerobic and anaerobic exercise for all 217 officers was 4.6 hours. This includes the officers who indicated they worked out fewer than a combined 5 hours per week and the officers who indicated they did not work out. The range of combined work out hours was 0 to 16 hours per week.

The % of responding officers who indicated they spent 5 or more hours per week participating in aerobic, anaerobic, or a combination of both, were injured on duty, maintained a strict caloric diet (defined as 2500 calories per day for males and 2200 calories per day for females), and whose agency provided a paid fitness center membership.

Kosmadopoulas A (2017) evaluated Effects of Shift work in the eating behavior of Police officers on patrol in Canada. It states More than 2000 calories were consumed relative to individual metabolic requirements on rest days than both evening- and night-shift days, largely sourced from increased fat and carbohydrate intake. More calories were consumed during the night, between 2300 h and 0600 h, on night-shift days than any other days. Caloric intake occurred significantly later for night-shift days than for rest days and was dispersed across a longer eating window.

Frauss et al., (2020) opined Metabolic Syndrome in Female Police Officers and Female Office Workers: A Cross-Sectional Study in Occupations with Different Physical Activities in Germany that Female OWs presented a high prevalence of obesity, shown in average abdominal waist circumference (85.3 ± 14.5 cm) above the threshold of ≥80 cm. 60% of OWs versus 25% of POs had an abnormal abdominal waist circumference. Concerning other metabolic risk factors (HDL, triglycerides, body mass index, blood pressure) no significant differences were found, but a tendency toward a higher prevalence of abnormal values is presented in OWs than POs. Metabolic syndrome was detected in almost 8% of OWs as compared with 5% in POs ($p = 0.705$).

Filip Kuki´ et al., (2022) conducted study on Body Composition and Physical Activity of Female Police Officers: Do Occupation and Age Matter? In Switzerland. The study revealed that the main findings of this study suggest that although communal police officers had lower BMI and %BF, the difference could be attributed to their age rather than to occupation.

This was further confirmed in the analysis of differences in body composition relative to age of officers as younger officers had better indicators of body composition. The study's practical implications suggest that the police agencies should develop human-centered policies that would support officers in taking care of their physical fitness and health rather than simply focusing on job performance. Improvements in body composition components such as skeletal muscle and body fat lead to better movement potential and lower health risks, ultimately contributing to agency performance. Good preventive policies are good for both officers and agencies. Providing officers with designated time for physical activity during working hours may be a good start. Fitness and nutrition departments in police agencies are great examples of a sustainable approach to taking care of employees. Unfortunately, these are very rare examples. Future studies should include interventions and longitudinal follow-up studies in order to determine actionable guidelines for officers and agencies on how to improve and maintain body composition.

Gifty B (2022) examined an evaluation of Eating Pattern and Nutritional Status of Police Personnel in the Tamale Metropolis in Ghana. The study revealed that the police eat two main meals, skip breakfast or eat in between meals, consume alcohol, ate foods belonging to the meat, soft drinks, fish, grain and eggs groups and their diet were more moderately diverse.

National scenario

Ramkrishna et al., (2008) studied high prevalence of cardiovascular risk factors among policemen in Puducherry, south India that Mean age of study participants was 40.9 years (SD ± 10.9). Out of the study subjects, 23% (n = 60) were known diabetic and 16.8% (n = 43) were known hypertensive. Prevalence of diabetes among study participants was 33.6% (CI: 27.8%-39.6%). Prevalence of HT among study participants was 30.5% (CI: 24.9%-36.5%). Seventy

percent (n= 178) had at least moderate range of stress in their life related to their profession and 4% (n = 11) had stress as a "problem" in their life.

Balaji A (2015) evaluated health profile of Mumbai police personnel: A cross-sectional study. It was done on 40-50 age groups predominant among policemen. Maximum policemen were married (91%). Educational qualification in policemen were secondary (36.2%), higher secondary (48.6%), graduation and above (15.2%). In our study 55% were addicted to nicotine alcohol abuse in 26% policemen. Most of the policemen were complaining of
musculoskeletal problems (62.7%), gastrointestinal problem (51.8%), and dental problems (41%). Prevalence of hypertension was 42.4%. Forty-eight percentage policemen were pre obese while 20% obese in this study.

Hoque et al., (2016) conducted a study on Dietary Habit and Nutritional Status of
Police Staff at Bangladesh which states most of the respondents represented from 20-39 years age group, male and Muslim. Most of the respondents (72%) had normal nutritional status whereas overweight was 24% followed by obese 3%. Regarding diet almost all of them consumed rice 2-3 times daily. Exactly half of the respondents took poultry 2-3/week whereas beef and mutton consumed 1/week. More than half of the respondents had egg and fish
1/day. About 58% study subjects took vegetables 2-3/day whereas fruits were taken 1/day.

John et al., (2016) examined Lifestyle behaviors and the need for health promotion in
Police personnel which reported poor dietary practices like skipping meals and frequent consumption of junk foods was seen among all the respondents of the study irrespective of income and education from the investigations carried out it was found that police officers were expected to put in long working hours as most of them worked more than 15 hours a day 28.5 percent of the officers were overweight and were found to be following a sedentary life style.

Sanghavi et al., (2016-17) carried out study on Prevalence of Hypertension and its Determinants among Policemen in a City of Haryana, India which provided a valuable insight on out of 450 participants, 164 (36.4%) participants were found to be hypertensive. Age of study participants,

duration of service, rank, and education are significantly associated with the prevalence of hypertension (HTN) among policemen.

Raju et al., (2017) examined Prevalence of generalized and abdominal obesity in police worker - Across-sectional study in Uttar Pradesh. In this study, the mean age of individual was 40.34 ± 8.23 and mean duration of service was 23.29 ± 8.49. Majority (95.92%) of police worker were involved in field or shift duty and only 4.08% of individual involved in office work, 77.14% of individuals were having generalized obesity and 82.04% were having Abdominal obesity.

Sahul et al., (2017) examined Health Condition of Traffic Police Personnel in Nagpur Division of, India which states that more than 50 percent of traffic police personnel are overweight, and 17 percent are obese. Between male and female traffic police personnel, there is a significant difference in BMI ($\chi 2$=14.069, df=3, p=0.003). Forty percent of traffic police personnel suffer from musculoskeletal disorders, cardiovascular disease, and diabetes in 11 percent of traffic police personnel.

Sunil et al., (2018) evaluated a study on Health Profile of Kolar Police Personnel: A Cross-Sectional Study which was carried out in Karnataka that states total of 200 Police personnel were interviewed. Prevalence of Obesity was 68% and Overweight was seen in 16%. 23.5% were Tobacco users and 28% were consuming Alcohol. 46% of the people were suffering from Musculoskeletal Problems. 23% were diagnosed to have Diabetes Mellitus, 26% had Hypertension and 64.5% had Metabolic Syndrome. 183(91.5%) had abnormal lipid profile.

Nagendra A (2019) conducted a study on Dietary Habits and Nutritional Screening of Bangalore City Police that say Mean BMI was found to be 26 kg/m2 ± 2.9 where majority of them (50%) were falling in the category of overweight and 8% had BMI >30 kg/m2 indicating obesity 60% of the total subjects were obese, self-reported morbidities showed 13% were diabetic, and 85% had clinical symptoms. 88% did not have loss of appetite. 63% and 65% male had a habit of smoking and alcohol consumption respectively 78% were nonvegetarians and most of them skipped their meals (55%) and also followed an irregular meal pattern. 75% had a sedentary

lifestyle, with no exercise When BMI was compared with the health indicators like blood sugars, 90% male and 100% female were found to be obese.
Similarly, with SBP>130 mmHg; 70% male and 60% female were lying in the category of obesity consumption of rice (87%) and wheat (18%) were the most commonly used cereals on a daily basis, 37% used ragi twice a week but 47% never used jowar. Among the pulse group 77% of them used pulses daily and 42% were consuming whole grams once a week vegetable group which was consumed in fair amounts by most of the staff, where green leafy vegetables were taken twice a week by 35% and thrice a week by 25%; whereas, other vegetables (45%) and roots and tubers (42%) were used on a daily basis. Only 17% of the group consumed fruits daily while 33% and 30% used twice and thrice a week respectively. Most of them took milk daily (92%) and curd was used by 40% regularly. As 78% of the group was non-vegetarians, 50% of them consumed eggs on a weekly basis (twice a week) similarly 48% were having either chicken or fish once a week. 20% and 30% never consumed chicken or fish and meat respectively. Salt, fats and oils showed 100% consumption. 10% never took sugar and 38% showed occasional consumption of sweets. Fast foods/outside foods or bakery products was consumed once a week by most of the police staff 35% and 45% respectively. 15% had alcohol twice a week

Muragod et al., (2018) conducted a study on Nutritional Status of Women Police of Hubballi-Dharwad, Karnataka. It stated that 3.33 %of police women were underweight and 31.11 per cent were normal remaining 66 per cent were obese.
Specifically, pre obese (23.33%), obese grade I (26.67%) and obese grade III (15.56%) category. Waist to hip ratio of women police revealed that, 51-56 per cent of women police exhibited risk of metabolic complications across the age groups. Further highest proportion of women among more than 54 years (66.67%) exhibited substantially increased risk of metabolic complications with WHR of more than or equal to 0.85. A strong positive association was recorded at 0.05 per cent level of significance for age and BMI of women police.

Rai and Archana (2022-23) conducted an interventional study of Nutritional status, mental health and job satisfaction of women working in Police Varanasi district. It was observed that SC (40.35%) has highest representation followed by OBC (30.8%) and general (25.06%) while ST (4.51%) has the least representation in female police force of Varanasi District. 11.3 % respondents

are in underweight category, 78.4% of the respondents had normal Body Mass Index, while 7.5% of the respondents lie in overweight category and only 2.8% of the
respondents were obese. The intervention shows improvement in the BMI of some respondents, with 8 individuals moving from overweight to the normal range. There was no impact on obese respondents, the average BMI of all respondents improved slightly and improved
job satisfaction for 14 respondents' Mental health- 9% have a poor level, while 48.8% have an average level, 38.7% have a good level, and 3.5% have a very good level of
mental health

Padmanabhan et al., (2024) carried out a study on Cardiovascular risk factors and metabolic syndrome among police officers in Kozhikode corporation of Kerala. The study revealed Metabolic syndrome was observed in 45.1% of the study population. Obesity and lack of physical activity were the commonest abnormalities. Cardiovascular risk factors identified were high BMI(67.3%), lack of physical activity (47.1%), hypertension (16.7%), alcohol use (24.2%), smoking (17.3%) and diabetes (8.8%). Conclusions: There is a rising prevalence (16.8% in 2012 to 45.1% in 2021) of Metabolic Syndrome among policemen in Calicut Corporation.

Reddy K (2024) a dietitian suggest that Prioritize hydration, opt for healthy snacks, and make smart choices when eating out by selecting grilled options and whole grains based foods. Mindful eating practices, such as portion control and regular mealtimes, and limiting caffeine and sugar , will help maintain steady energy levels and overall wellbeing despite a hectic schedule.

A survey by Local circles (The Print)(2025) on the study titled ' How India sleeps-2025' was carried out on World Sleep Day on 14th March'2025 which revealed about 72% of the respondents out of 14,952 cited waking up to use the washroom as the primary reason, 25% could not sleep due to poor schedules,22% due to external noises and mosquitoes, 9% due to medical conditions like sleep apnea, 9% due to partner or child related interruptions & additionally , 6 percent faced sleep disturbances due to mobile calls or messages. The survey report suggested that insufficient and fragmented sleep has been linked to several health concerns, including cardiovascular diseases, metabolic disorders such as type 2 diabetes, and cognitive impairment. " disorders like restless leg syndrome and bruxism are known to disrupt sleep. Other conditions, including

nocturia, cardiovascular issues, as well as hormonal, lung and neurological problems may threaten sleep continuity," The report said, adding that certain prescription drugs can have sleep related side effects.

Regional scenario

Naik K (2012) conducted a study on Stress Among Police: A Case Study on the Police Personnel at Waghodiya, Panigate & Airport Road Police Station in Vadodara City.
The finding of the study suggests that there is a significant difference of level of stress among police personnel at various police station. Sources of stress vary as per their nature of profile, shifts, designation, role and responsibilities.

Kumar et al., (2017) examined Prevalence of Chronic Morbidity and Sociodemographic Profile of Police Personnel: A Study from Gujarat. In the study population, 95.10% were males. The prevalence of chronic morbidity, hypertension and diabetes were 9.5%, 5% and 2.6% respectively. About 47.05% had normal BMI and mean BMI was 24. The study revealed that 7.64% police personnel had the habit of smoking, 3.16% consumed alcohol whereas 24.03% consumed tobacco products. It was found that 138 (14.05%) were active in sports and 304 (30.95%) were actively involved in exercise while 44 (4.48%) were involved in yoga. Conclusion The prevalence of hypertension (5%) and diabetes (2.6%) were low as compared to the general population (NFHS-4). This can be attributed to health consciousness prevalent among the population. A substantial number of study population were involved in sports, exercise and yoga.

Solanki and Shukla (2021) conducted a cross-sectional study on assessment of health profile of policemen serving at Ahmedabad city, Gujarat. The study revealed that the mean age of study participants was 42 years. In context to BMI, total75.3% policemen were either overweight or obese. Policemen with tobacco addiction were 186(45%). Of total, 11.29% and 7.69% were hypertensive and diabetics respectively. Around three fourth (74%) policemen complained of perceived stress.

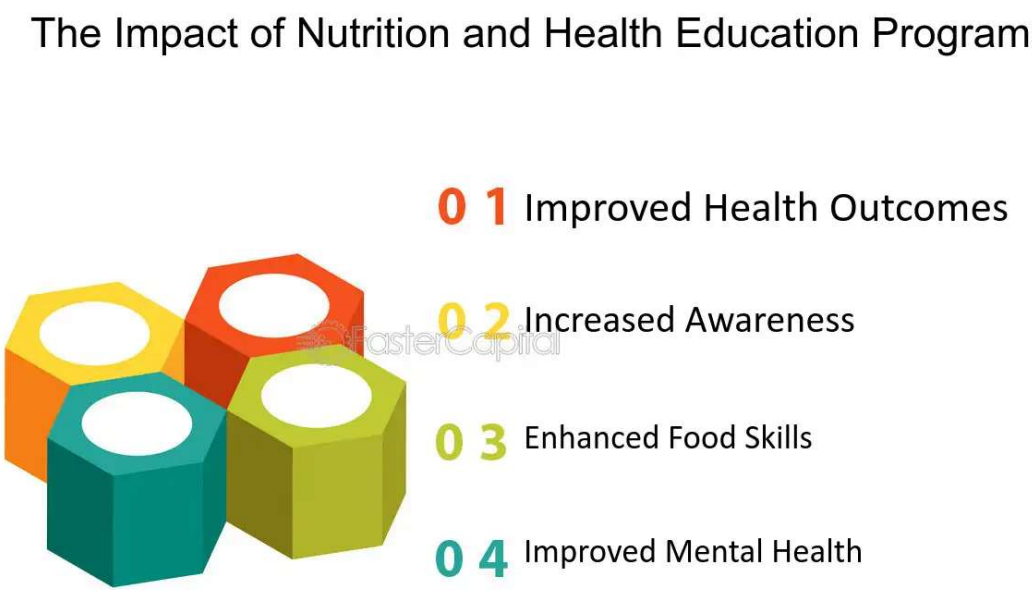
Sharma et al., (2023) conducted a study on Women in Law Enforcement: Challenges Encountered by Female Police Officers, specifically within the Gujarat Police The study revealed that the age of the majority of the women working in the police force is less than 30 years.

Age and marital status are the two variables that affect the mental health of the women police. Family members and children have no impact on the mental health of the women police.

Impact of Nutrition health education on dietary practices

Nutrition health education has a significant positive impact, improving knowledge, attitudes, and practices related to healthy eating, ultimately leading to better health outcomes and disease prevention.

Figure 2.1



Source- The Impact of Nutrition and Health Education Programs - Promoting a Healthy Lifestyle: CCPH's Innovative Wellness Programs

Benefits:

Improved Knowledge and Attitudes:

- Enhanced understanding of nutrition:

Nutrition education empowers individuals to understand the importance of different nutrients and how they contribute to overall health.

- Positive attitude towards healthy eating:

Education can foster a positive attitude towards healthy food choices and eating habits, leading to better adherence to dietary guidelines.

- Increased awareness of health risks:

Individuals become more aware of the link between diet and chronic diseases, motivating them to make healthier choices.

Health Benefits and Disease Prevention:

- Reduced risk of chronic diseases:

A healthy diet, promoted through nutrition education, can significantly reduce the risk of developing chronic diseases like heart disease, diabetes, and obesity.

- Improved infant, child, and maternal health:

Better nutrition, facilitated by education, leads to improved health outcomes for infants, children, and mothers, including stronger immune systems and safer pregnancies.

- Enhanced cognitive function and learning:

A healthy diet supports optimal brain function and cognitive development, leading to improved learning and academic performance.

- Reduced risk of malnutrition and micronutrient deficiencies:

Nutrition education can help individuals understand the importance of consuming a balanced diet to prevent malnutrition and micronutrient deficiencies.

- Improved oral health:

A healthy diet, as taught through nutrition education, can contribute to better oral health and reduce the risk of dental problems.

- Increased longevity:

A healthy lifestyle, including a balanced diet, can contribute to increased longevity and a higher quality of life

Studies on impact of NHE on dietary practices:

Jeewan and Duneeram (2015) opined on Healthy Diet and Nutrition Education Program among Women of Reproductive Age: A Necessity of Multilevel Strategies or Community Responsibility in Mauritius. It states that adequate nutrition and healthy lifestyle behaviors such as physical activity and alcohol consumption are to be given significant consideration among women of

reproductive age to optimize the health of their babies as well as their own health. There is strong evidence from published studies, which demonstrate that nutrition, and physical activity interventions have had a positive impact on the behaviors of women of reproductive age resulting in optimistic health outcomes. It has been found that multiple health intervention strategies have been more successful in modifying health behaviors of women of reproductive age.

Whatnall et al., (2017) carried out a systematic review on effectiveness of brief nutrition interventions on dietary behaviors in adults. It states that Brief interventions are effective in improving health behaviors including alcohol intake, however the effectiveness of brief interventions targeting nutrition outcomes has not been determined. The aim of this systematic review was to determine the effectiveness of brief nutrition interventions in adults. Seven databases were searched for RCT/pseudo RCT studies published in English to April 2016, and evaluating brief interventions (i.e. single point of contact) designed to promote change in eating behaviors in healthy adults (≥18 years). Of 4849 articles identified, 45 studies met inclusion criteria. Most studies targeted fruit and/or vegetable intake (n = 21) or fat intake (n = 10), and few targeted diet quality (n = 2). Median follow-up was 3.5 months, with few studies (n = 4) measuring longer-term outcomes (≥12 months). Studies aimed to determine whether a brief intervention was more effective than another brief intervention (n = 30), and/or more effective than no intervention (n = 20), with 17 and 11 studies, respectively, reporting findings to that effect. Interventions providing education plus tailored or instructional components (e.g. feedback) were more effective than education alone or non-tailored advice. This review suggests that brief interventions, which are tailored and instructional, can improve short-term dietary behaviors, however evidence for longer-term behavior change maintenance is limited

Mangwane et al., (2024) carried out a study on Impact of a Nutrition Knowledge Intervention on Knowledge and Food Behavior of Women Within a Rural Community. The findings of the study suggest a positive shift towards increased consumption of nutrient-rich food groups. There were significant improvements in the food groups' consumption of the meat group (7.15 ± 2.35), eggs (1 ± 0), dairy (3.76 ± 1.19), cereal (8.78 ± 2.09), legumes (2.86 ± 0.95) and fats and oils (2.12 ± 0.55). Additionally, the variety of food groups consumed significantly improved (p = 0.012) post-intervention, with an increasing trend in the consumption of a variety of food groups (7-9).It was recommended that tailored nutrition education (NE) programs, in conjunction with addressing

socioeconomic barriers positively impact nutritional behaviors, promote healthier food consumption patterns and assist in long-term knowledge retention in disadvantaged communities.

Prasad et al., (2017-2020) carried out a Quasi-Experimental Evaluation of a Nutrition Behavior Change Intervention Delivered Through Women's Self-Help Groups in Rural India. It was observed that Women consumed 3.6–4.0 food groups on average, and the percentage of women who achieved minimum dietary diversity was lower in the endline sample (∼20%) compared with the baseline sample (∼30%) Only one-third of women consumed any animal-source foods, but two-thirds consumed unhealthy foods. The NI intervention had a positive protective effect against a decline in consumption of nuts and seeds (full sample DID 0.04, $P = 0.02$) but a negative effect on the consumption of dark-green leafy vegetables (full sample DID −0.08, $P = 0.04$); neither of these impacts were statistically significant in the analysis of households with ≥1 SHG member. The positive impact on consumption of nuts and seeds is not very meaningful given that very few women consumed nuts and seeds (∼5% at baseline and ∼3% at endline). Underweight was common in women (40–50%) but we found no impacts of the nutrition intensive intervention on women's BMI or underweight. Women's knowledge of nutrition information delivered as part of the NI intervention ranged from 50 to 90 on a 100-point scale for different knowledge domains. Knowledge of maternal health/nutrition and dietary diversity was higher than knowledge of child health/nutrition. However, knowledge unexpectedly improved more in the STD group compared with the NI group

Krishna P (2022) conducted a study on dietary habits of women faculty and impact of nutrition education in Tamil Nadu. The findings of the study revealed that dietary pattern assessment revealed that, most study participants were non vegetarians and consumed three meals a day, Inadequate intakes of pulses, green leafy vegetables, other vegetables, fruits, milk and milk products were observed. Frequent intake of carbohydrate rich foods, fats and oils but an infrequent intake of protein rich foods and vitamin and minerals rich foods in a week. Malnutrition were linked to low intakes of pulses and beans; milk and dairy products; vegetables and fruits food groups. After nutrition education, the scores for knowledge and attitude have increased than scores for practice. Women of the study population had an unhealthy dietary pattern. So, nutrition education was provided and the impact was assessed using KAP scores and after the education KAP scores have increased than before.

METHODOLOGY:

Women police officers face unique physical, mental, and emotional challenges due to the demanding nature of their profession. Ensuring they are nutritionally, mentally, and physically fit is essential for their performance, endurance, decision-making, and overall well-being. Proper nutrition is not just about staying fit, it's about survival, resilience, and peak performance. A well-planned diet and awareness on nutrition and dietary diversity can enhance physical strength, mental clarity, emotional stability, and long-term health, allowing them to serve effectively while maintaining their well-being.

The study was aimed with a broad objective to assess the nutritional status, knowledge about nutrition, dietary practices and impact of counselling on dietary practices of Mahila police of urban Vadodara.

Specific Objectives were:

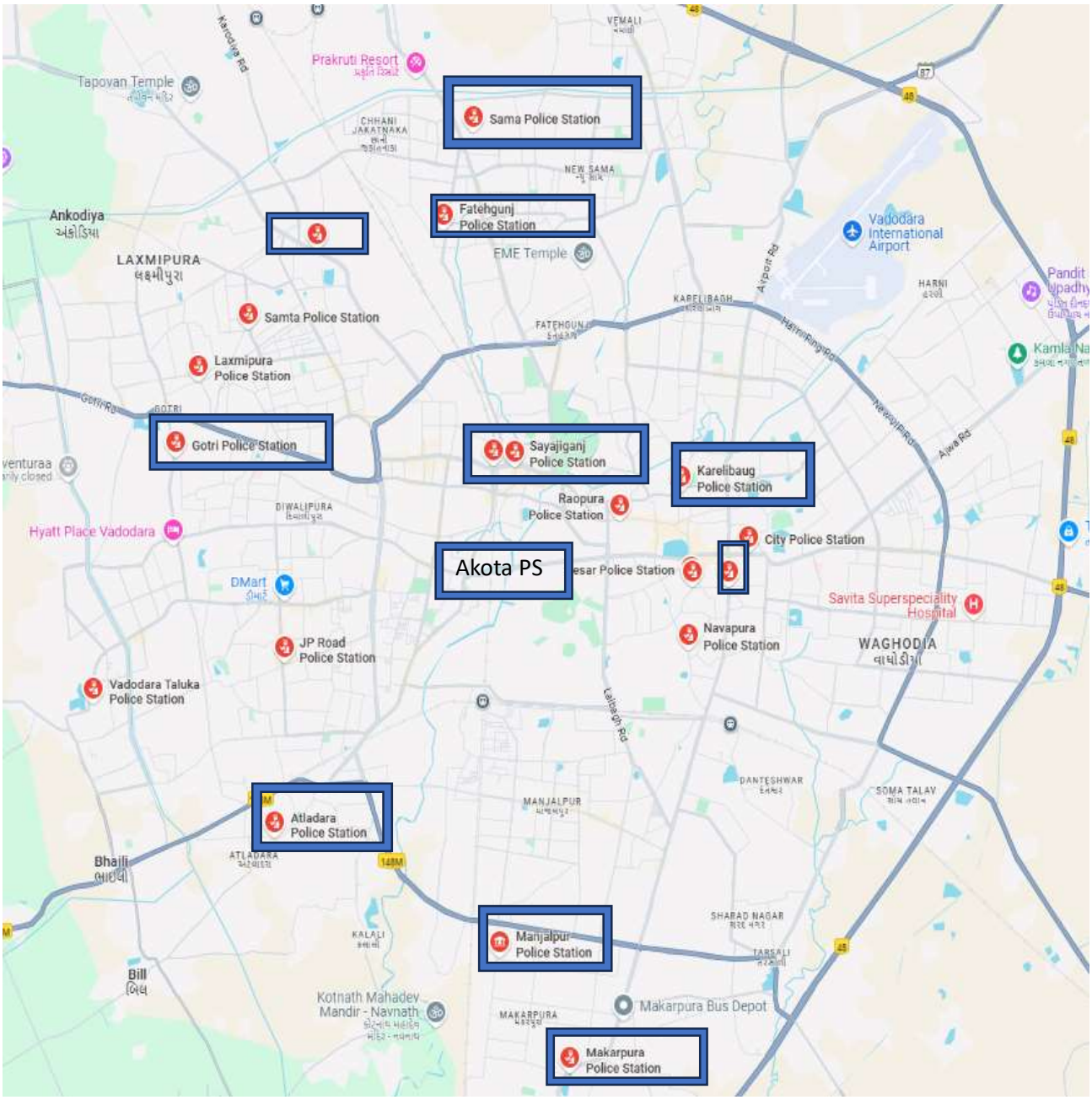
- To assess the background information of mahila police from selected police stations of urban Vadodara.
- To assess the anthropometry based nutritional status of mahila police and prevalence of anemia (secondary source) in mahila police
- To assess the knowledge on selected aspect of nutrition and dietary practices of Mahila police.
- To conduct counselling sessions for 8 weeks (once weekly for 1-2 hrs with IEC material) to Mahila police of enrolled police station of Vadodara.
- To see the impact of sensitization on mahila police for changes in their dietary practices.

The study was approved under the Department of Medical Ethics Committee (No. IECHR/2024/25), The Maharaja Sayajirao University of Baroda, Vadodara.
Study site: Urban Vadodara which is presented in fig 3.1
Vadodara city police is divided into four zones:1,2,3 and 4. It is further divided into 8
Divisions A, B, C, D, E, F, G and H having total of 26 police Stations under it. Under each division

there are 4-5 police station. So, we have randomly selected 2 police stations under each division which makes total 16 police stations.

In all there were 8 divisions but permission was given for 5 division only so 12 police stations were randomly selected to enroll required sample size.

Figure 3.1 Study location -Urban Vadodara



Sampling size

Sample size calculation:

Prevalence on undernutrition of women police was found to be 11.3% by Rai, Archana (http://hdl.handle.net/10603/544206 An Interventional Study of Nutritional Status Mental Health and Job Satisfaction of Women Working in Police Varanasi District)

Prevalence of underweight is 11.3%

Deviation-5%

CI-95%

Using the formula,

N = 1.962 x p (1-p) / d2

= 3.84*0.113(0.887)/0.0025

0.384/0.0025

N=154 adding 20% dropout so it will be 154+31=185

Total sample size was calculated as 185 Mahila Police.

Selection of the respondents:

Vadodara city police is divided into four zones i.e. East, west, north and central zone. It is further divided into 8 divisions A, B, C, D, E, F, G and H having 26 police stations. Under each division there are 4-5 police stations. After obtaining necessary permission from CP, Vadodara a total of 12 police station from 5 Divisions (A, D, E, F, H) were enrolled for the study. All the Mahila police were covered and were enrolled for the study. In all 191 could be interviewed for baseline

STUDY DESIGN:

This study was divided into 3 phases.

Details of the experimental design for the research is presented in Fig.3.2

- Phase-I Situational analysis
- Phase-II Sensitization of Mahila police through Group counselling
- Phase-III Impact Evaluation

Phase I Situational analysis

In this phase of the study, we have conducted baseline assessment of Mahila Police with a specific focus on assessing the **knowledge on selected nutrition components, dietary diversity and nutritional status.**

Following data was obtained using a pre-tested semi-structured questionnaire

- Socio demographic profile of Mahila police (Appendix IV)
- Anthropometric Measurements (Appendix IV)
- Physiological status and nutritional status (Appendix IV)
- Knowledge on selected nutrition components and dietary practices (Appendix IV)
- Prevalence of Anemia (Appendix IV)

Following inclusion and exclusion criteria were for the mahila police:

- **INCLUSION CRITERIA:**

  All mahila police of selected police stations of urban Vadodara those who give consent.
- **EXCLUSION CRITERIA:**

  Nill

Hypothesis:

Null(H0): Counselling on basic aspects of food and nutrition will not have impact on knowledge and dietary practices of Mahila police.

Alternative(H1): Counselling on basic aspects of food and nutrition will have impact on knowledge and dietary practices of Mahila police.

Socio demographic profile of Mahila police:

Information on the socio-economic background of Mahila Police was collected using a pre-tested questionnaire. Information regarding age, religion, caste, type of family, marital status, qualification, occupation, medical history, addiction, was collected. **(Appendix IV)**

Anthropometric measurements:

To assess the prevalence of anthropometry-based malnutrition, weight, height, waist, hip measurements were assessed using standard methods.

Weight Measurement

Weight is a key anthropometric measurement of body mass. It is a sensitive indicator of malnutrition and can be useful for estimating status of the individual.

Methodology

A digital bathroom weighing scale was used to take the weight of the respondents. It is portable and can be conveniently used in the field. The respondents were asked to stand erect on the scale without touching anything with no heavy clothing or footwear and looking straight ahead. The scale was set to zero before each measurement, calibrated periodically and was recorded to the nearest of 0.100 kg. In some cases, the respondents knew their weight so were asked about the same. It will be further assessed for calculating their BMI as per **Asia pacific classification 2007**

- **Underweight:** BMI < 18.5 kg/m²
- **Normal weight:** BMI 18.5–22.9 kg/m²
- **Overweight:** BMI 23.0–24.9 kg/m²
- **Obesity:** BMI ≥ 25 kg/m²

Height Measurement

Height is a linear measurement of body made up of the sum of four components: legs, pelvis, spines and skull (Jelliffe 1966).

Methodology

Height was measured using flexible non-stretchable tape to an accuracy of 0.1 cms. The tape was fixed vertically on a smooth wall of the house perpendicular to the ground, ensuring that the floor was smooth. The respondents were asked to stand erect with the shoulders, hips and heels touching the wall and with no footwear, heels together and looking straight ahead. The head was held comfortable erect, arms hanging loosely by the sides. A thin smooth scale was held on the top of the respondents' heads in the centre, crushing the hair at the right angles to the tape and the height of the respondents were read from the lower edge of the ruler to the nearest 0.1 cms.

WC- Waist circumference

It's a measurement used to assess abdominal fat stores, which are linked to increased risk of various health problems.

WHO's high-risk thresholds:

Men: Waist circumference greater than 102 cm (40 inches).

Women: Waist circumference greater than 88 cm (35 inches).

Methodology:

To measure waist circumference, respondents were asked to stand relaxed with feet shoulder-width apart, and then with fiberglass tape measurement was taken around the waist at the midpoint between the lowest rib and the top of the hip bone (iliac crest) after a gentle exhale. Readings were recorded in cms and inches too.

Hip circumference

Hip circumference, a measurement taken around the widest part of the buttocks, is used to assess body fat distribution and is part of the waist-to-hip ratio (WHR) calculation, which the World Health Organization (WHO) uses to assess abdominal obesity

Methodology:

Respondents were asked to stand straight with feet together. A fiberglass tape was used to measure their hip circumference around the widest part of the buttocks. Readings were recorded in cms and inches too.

After taking waist and hip measurements, **WHR (**waist hip ratio) was calculated to assess their abdominal obesity

WHO WHR cut-off points

- For men, the WHO recommends a WHR cut-off point of 0.90
- For women, the WHO recommends a WHR cut-off point of 0.85

Blood pressure

The World Health Organization (WHO) defines blood pressure as the force of blood pushing against the walls of arteries. Blood pressure is measured in millimeters of mercury (mm Hg).

Blood pressure was measured using automatic blood pressure monitor

Placed the cuff on their bare upper arm one inch above the bend of elbow. The tubing falls over the front center of arm so that the sensor is correctly placed. Pulled the end of the cuff so that it's evenly tight around their arm. Placed it tight enough so that two fingertips can slip easily under the top edge of the cuff. It was made sure that skin doesn't pinch when the cuff inflates.

Afterwards pressed start. The respondent was asked to remain still and quiet as the machine begins measuring. The cuff inflates, then slowly deflate so that the machine can take their measurement. When the reading was completed, the monitor displayed their blood pressure and pulse on the digital panel. If the monitor didn't record a reading, repositioned the cuff and tried again. Reset quietly and was asked to wait about one to two minutes before taking another measurement.

Recorded their numbers by writing the information down.

Hemoglobin levels

Prevalence of anemia was assessed through their reports done within 1 month of the interview. Cutoffs used for the prevalence of anemia

Mild anemic	11-11.9 g/dl
Moderate anemia	8-10.9 g/dl
severe	<8
No anemia	12 g/dl

According to the classification of World Health Organization (WHO), pregnant women with hemoglobin levels less than 11.0 g/dl in the first and third trimesters and less than 10.5 g/dl in the second trimester are considered anemic

Anemia in Lactating Mothers:

- Hb < 12.0 g/dL

Knowledge and Practices

Knowledge and practices were obtained using pre-tested semi-structured questionnaire on following topics: (**Appendix IV)**

- Selected Nutrition Topics (NCDS, Anemia and Basics of nutrition)
- Dietary Practices

Dietary Information

General dietary pattern

Dietary information regarding type of diet, various food groups, nutrients required in daily diet, unhealthy foods, meal eating patterns, frequency and consumption of breakfast, soft drinks, junk foods and beverages, and dietary diversity were taken using pre-tested semi structured questionnaire. **(Appendix IV)**

24-hour dietary recall

Information on dietary intake was taken by recall of diet of the previous day (24 hour) with ingredients of 191 Mahila police officers. **(Appendix IV)**

Minimum Dietary Diversity for Women of Reproductive Age (MDD-W)

MDD-W is a dichotomous indicator of whether or not women 15-49 years of age have consumed at least five out of ten defined food groups the previous day or night. The proportion of women 15-49 years of age who reach this minimum in a population can be used as a proxy indicator for higher micronutrient adequacy, one important dimension of diet quality.

The MDD-W was developed as a proxy indicator to reflect the micronutrient adequacy of women's diets. It is a population-level indicator based on a recall period of a single day and night, so although data are collected from individual women, the indicator cannot be used to describe diet quality for an individual woman. **(USAID, FANTA 2016)**

Methodology

From one day dietary recall, list of food groups consumed by the Mahila police was prepared and MDD-W was computed. **10 Foods groups** were: Grains, white roots and tubers, and plantains, Pulses, Nuts and seeds, Dairy, Meat, poultry and fish, Eggs, Dark green leafy vegetables, other vitamin A-rich fruits and vegetables, other vegetables, and other fruits. The score was given if the member has consumed the food group then we have given as 1 score and if they had not consumed then we have given them 2 score for each food groups.

Phase-II Sensitization of Mahila Police

Development of counselling module and IEC material

Total of 8 topics were identified which are as follows:

1. Basics of Nutrition and health
2. Concept of healthy diets and Dietary diversity
3.Importance of micronutrients for the body
4.Anemia and its prevention
5. Non-Communicable diseases
6.Consequences of junk foods
7. Importance of Physical Fitness
8.Advantages and disadvantages of social media on food consumption.

PowerPoint presentations and presentations and appropriate modules were compiled**.**

Total 191 Mahila police from 12 police stations were enrolled. Randomly 6 police stations were assigned as control(n=90) and 6 as experimental groups(n=101)

Phase – III Impact Evaluation

Sensitization of Mahila Police

Counselling was provided to 101 mahila police of 6 police stations in the experimental group. Soft copies of each session were also given in WhatsApp groups of Mahila Police(police station wise) Experimental group were given counselling sessions for 8 weeks for 1-2 hours

A Counselling module was developed and presented. I have prepared 8 presentations for 8 sessions to counsel all of them in hybrid mode i.e online sessions and offline counselling sessions were also done.

Topics covered in 8 sessions each weekly were:

1. Basics of Nutrition and health
2. Concept of healthy diets and Dietary diversity
3.Importance of micronutrients for the body
4.Anemia and its prevention
5. Non-Communicable diseases
6.Consequences of junk foods
7. Importance of Physical Fitness
8.Advantages and disadvantages of social media on food consumption.

After imparting sensitization for all the sessions, to evaluate the impact of the counselling sessions post data was collected on their knowledge retention related to selected Nutrition components, and dietary diversity.

Primary Outcome of the studies were:

- Assessing the socio demographic profile of Mahila Police
- Assessing knowledge on selected Nutrition topics, dietary diversity and dietary practices of mahila police
- Developing IEC Materials for sensitizing Mahila Police.
- Assessing knowledge retention and change in dietary practices.

Secondary outcome

Enabling environment and constraints in imparting nutritional health education to mahila police.

Quality Measures:

- Anthropometric measurements were done by calibrated instruments by the research student
- 8 counselling session was provided each weekly to Mahila Police by the researcher in local language
- Confidentiality of the data was maintained

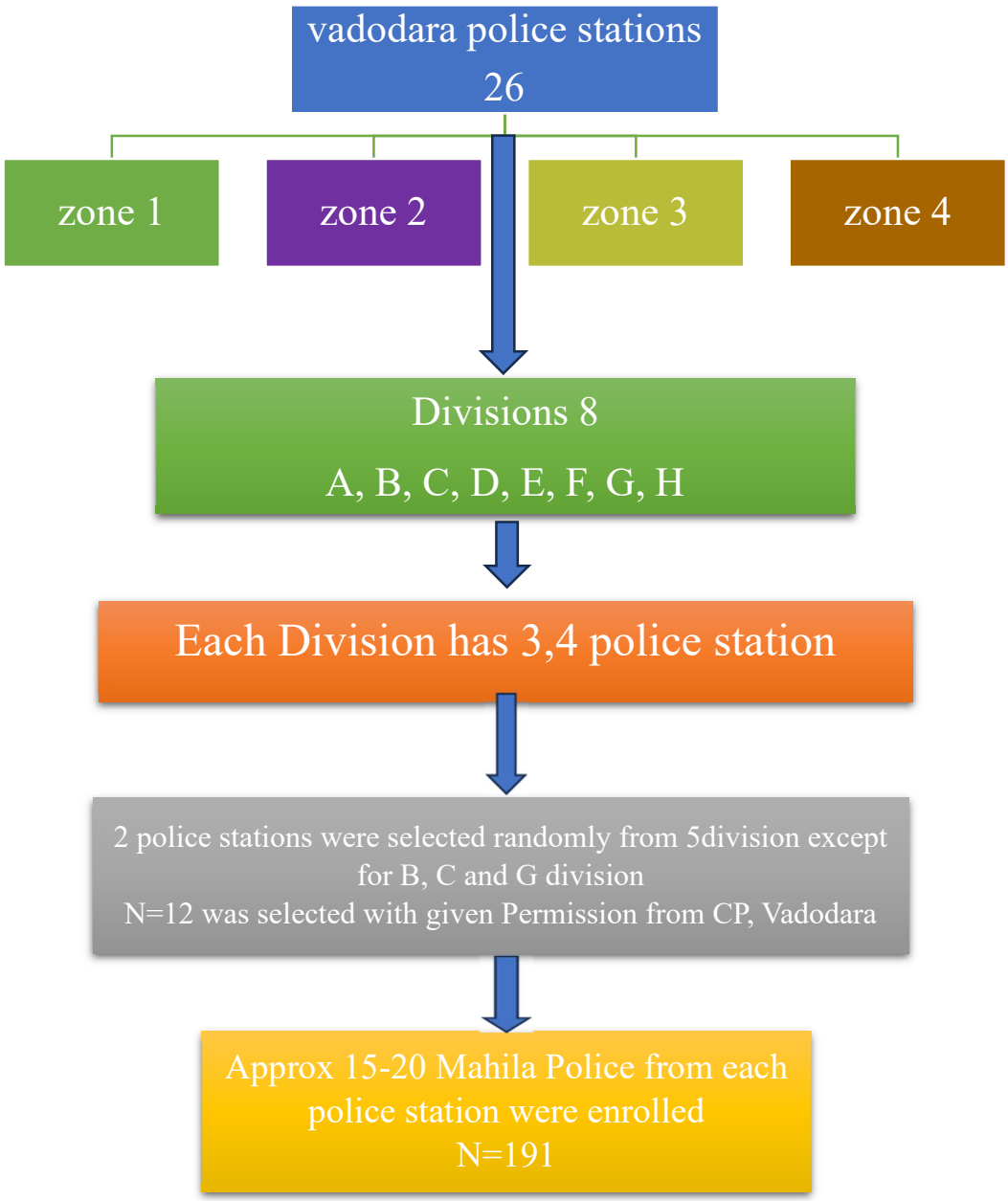
Data Management:

- The data obtained was entered into a personal computer in excel after cleaning and then was analysed using SPSS and Jamovi software.
- Mean, standard deviation, and standard errors was calculated for all the quantitative parameters.
- Appropriate analysis was done.

Tools and technique used for data collection

Parameters	Method/Tool
Socio economic status	Pre-Tested semi structured Questionnaire
Medical history	Pre tested Semi Structured Questionnaire
Height, weight, Waist Circumference, Hip Circumference,	Standard Methods (Non stretchable fiberglass measuring tape & Bathroom weighing scale)
Blood Pressure	Sphygmomanometer
Physical activity	Pre-Tested semi structured Questionnaire
Hemoglobin estimation	Secondary source
Dietary practices	24 hr dietary recall

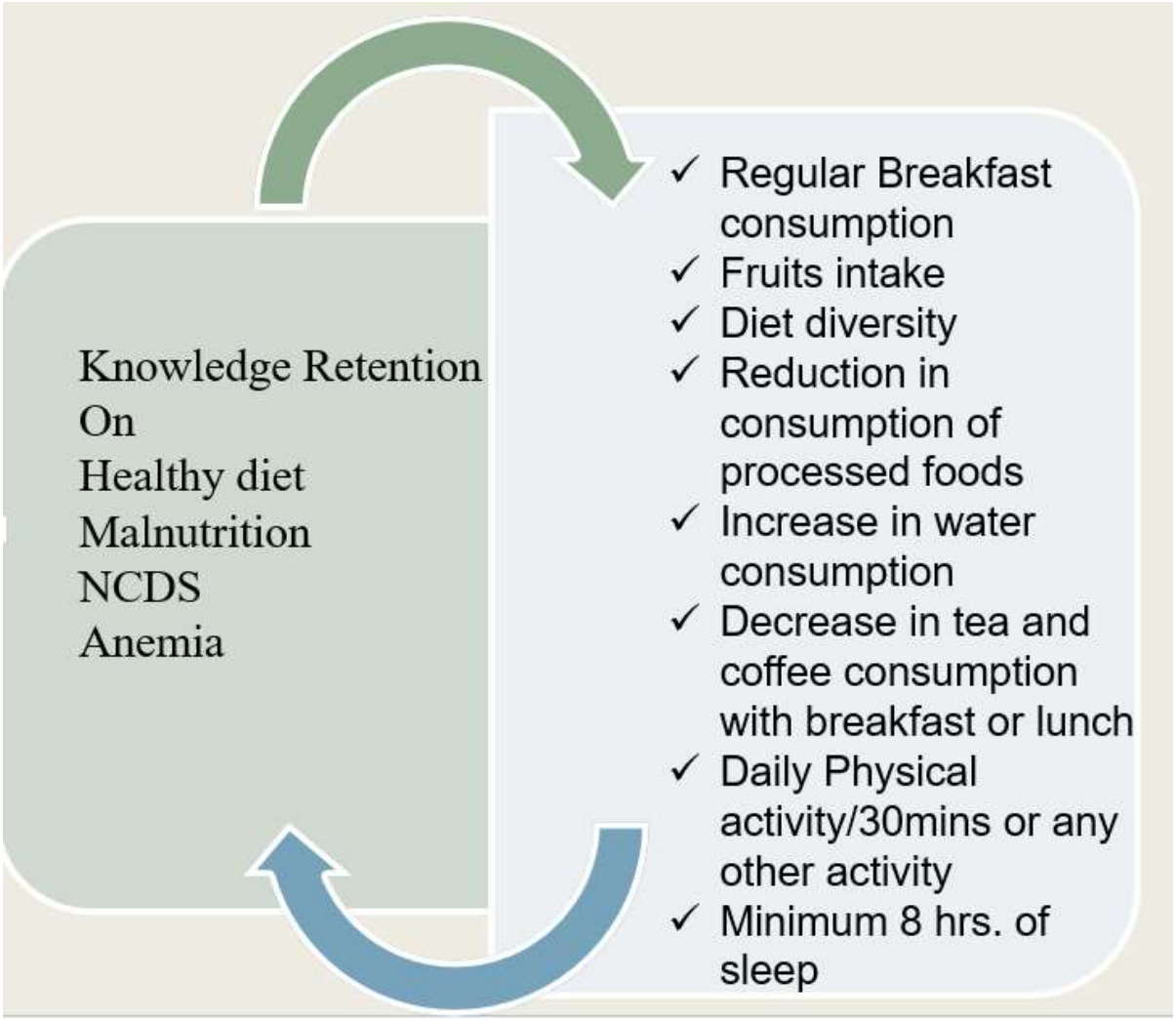
Phase wise Experimental Design:



- Assessing the background information of mahila police
- Anthropometry based nutritional status of mahila police and prevalence of anemia was assessed.
- Knowledge on selected aspect of nutrition and dietary practices of Mahila police will be assessed through Questionnaire


Police stations N=12 selected randomly
Total Mahila Police -191
Experimental group
N=101
Control group
N=90
Training module was developed for sensitizing Mahila police
Sensitizing mahila police of experimental group
sessions of group counselling in hybrid mode to experimental group only
8 weeks
For 1-2 hours weeekly with IEC material

Change in dietary practices:



RESULTS AND DISCUSSION:

IMPORTANCE OF NUTRITION IN MAHILA POLICE:

Nutrition is essential for the health and well-being of female police officers in India. As frontline law enforcement personnel, they encounter unique challenges and demands that necessitate optimal physical and mental fitness. Here's why proper nutrition is crucial for them:

1. Physical Fitness
2. Mental Health and Cognitive Function
3. Immune Function
4. Overall Well-being and Quality of Life

The present study was planned with broad objective to assess the nutritional status, knowledge about nutrition, dietary practices and impact of counselling on dietary practices of mahila police of urban Vadodara.

Specific Objectives of the study are:

- To assess the background information of mahila police from selected police stations of urban Vadodara.
- To assess the anthropometry based nutritional status of mahila police and prevalence of anemia (secondary source) in mahila police
- To assess the knowledge on selected aspect of nutrition and dietary practices of Mahila police.
- To conduct counselling sessions for 8 weeks (once weekly for 1-2 hrs. with IEC material) to Mahila police of enrolled police station of Vadodara.
- To see the impact of sensitization on mahila police for changes in their dietary practices.

The findings of the study are discussed in the following sections:

Section I: Baseline Assessment

- Socio demographic Profile of Mahila Police
- Anthropometry based nutritional status and prevalence of Anemia among Mahila Police
- Knowledge on selected aspect of Nutrition among Mahila Police
- Dietary practices of Mahila Police
- Physical activity among Mahila Police

Section II: Sensitization of Mahila Police with IEC material on concepts of Nutrition and Health among Mahila Police

- Development of Training module and PowerPoint presentations
- Sensitization of Mahila Police on topics of Nutrition and health for 8 weeks (once a week for 1-2 hour)

Section III: Impact Evaluation

- Knowledge retention on selected nutrition and health components
- Change in dietary practices

Baseline Assessment

Mahila police enrolled for the study

Vadodara City Police is organized into 4 zones i.e. Central, East, West and North zone. It is divided into 8 divisions (A, B, C, D, E, F, G and H) which is further divided into 26 police stations. Twelve police stations were selected randomly. Each Police stations has 25-30 Mahila Police. For the study 191 Mahila police were enrolled. Police station wise enrollment of mahila police is given in Table:4.1

Percent response rate was calculated. It can be seen from Table 4.1 that average percent response was 64% and it ranged between 47 to 86% for various police stations.

Reasons for non-availability of mahila police were mainly due to difference in posting and duty stations, force sent for security aspects for various events and long leave from duties.

Table 4.1: Police station wise enrollment of mahila police

Name of police station	Enrolled Mahila in police stations	Interviewed	Response rate
Police station 1	29	18	62
police station 2	35	21	60
Police station 3	35	22	63
Police station 4	14	8	57
Police station 5	21	18	86
Police station 6	22	13	60
Police station 7	24	13	54
Police station 8	30	23	76
Police station 9	23	16	65
Police station 10	29	17	55
Police station 11	23	11	47
Police station12	13	11	85
Total	298	191	64

Socio-Demographic Profile of Mahila Police:

Table 4.2 presents general information about mahila police, including their age, religion, caste, qualifications, designations, marital status, economic category, type of family, and working hours.

The mean age of the Mahila Police was 32 ± 7.56 years. Among the participants, 186 were Hindu (97.4%), followed by 4 Muslims (2.1%) and 1 Christian (0.5%). Approximately 86.3% of the Mahila Police belonged to reserved categories such as SC/ST/OBC, with 37% reported as OBC, ST with 30.4%, SC with 18.8 and only 13.6% belonged to the general caste. Seventy percent were found in the APL economic category, while 29.8% were BPL. A total of 111 Mahila Police were married (58.1%), 77 were unmarried (40%), and 3 (1.5%) were divorced and living separately. Around 61% completed their graduation followed by 30% with post-graduation degrees (29.8%), and 9.4% have studied up to higher secondary level.

Regarding their designation, it was reported that 56% of them were constables, followed by head constables (32.5%), assistant sub-inspectors (8.9%), police sub-inspectors (1%), and police inspectors (3.1%). About 67.5% had nuclear families and16.8% lived in joint families. Information on their job profile was also asked. It was reported that 87% had 8 hours job schedule and around 12% had more than 8 hours job.

Table 4.2 Socio demographic profile of Mahila Police

Particulars	**n=191**	**%**
Age(year)		
21-25	16	8.4
26-35	123	64.2
36-45	34	17.9
46-55	19	9.5
Total	191	100
Average Age range 21-55(year) & Average age is 32 ±7.56 SD		
Religion		
Hindu	186	97.4
Muslim	4	2.1
Christian	1	0.5
Total	**191**	**100**
Caste		
General	26	13.6
SC	36	18.8
ST	58	30.4
OBC	71	37.2
Total	**191**	**100**
Economic category		
APL	134	70.2
BPL	57	29.8
Total	191	100
Marital status		
Married	111	58.2
Unmarried	77	40.3
Separated	1	0.5
Divorce	2	1

Table 4.2 Socio demographic of Mahila police

Total	191	100
Educational status		
Post graduate	57	29.8
Graduate	116	60.7
Higher secondary	18	9.4
Total	191	100
Designation		
Police inspector	6	3.1
Police sub inspector	2	1
Assistant sub inspector	17	8.9
Head constable	62	32.5
Constables	104	54.5
Total	191	100
Type of family		
Nuclear	129	67.5
Joint	32	16.8
extended nuclear	30	15.7
Total	191	100
Age of children of enrolled Mahila Police		
<2yrs of age between 26-40	30	15.7
>2 yrs of age	51	26.7
No Children	110	57.6
Total	191	100
Physical Activity		
Working hours		
8 hrs.	167	87.4
>8hrs.	24	12.5
Total	191	100

Mean Anthropometric measurements of Mahila Police

Table 4.3 provides information on the anthropometric profile of the Mahila Police. The average height of the subjects was 159 ± 4.62 cm, while the average weight was 57.3 ± 9.37 kg. The average BMI was found to be 22.6 ± 4.02. The mean waist circumference (WC) of the respondents was 31.8 cm, the mean waist-to-hip ratio (WHR) was 0.814, and the mean waist-to-stature ratio (WSR) was 0.507. Abdominal obesity was found in 36 respondents (19%)

Criteria of Gujarat police

Category	**Height(cm)**	**Weight(kg)**
Sc candidates of Gujarat	**156**	**40**
All others	**158**	**40**

Table 4.3 Anthropometric Measurements of Mahila Police

Particulars		
Mean Height	159+-4.62	
Mean weight	57.3+-9.37	
Mean WC	31.8 cm	
Mean WHR	0.814	
Waist to height ratio (WSR)	**n=191**	**%**
Sim (0.35-0.4)	3	1.57
Healthy (0.4-0.49)	107	56
Overweight (0.5-0.59)	67	35
Obese (0.6 or more)	14	7.3
Total	191	100
Abdominal Obesity	36	19
Waist to hip ratio	**n=191**	**%**
<0.85	155	81.1
0.85-0.96	33	17.2
>0.96	3	1.5
Total	191	100

Nutritional Status of Mahila Police:

The prevalence of malnutrition was assessed using the WHO Asia-Pacific Classification (2007) based on BMI and is presented in **Table 4.4**. The mean BMI of the Mahila Police was reported as 22.6 kg/m² with a standard deviation of ±4.02. Most of the police officers fall into the normal weight category (41.3%), while 29.8% were overweight, 15.1% were obese, and the remaining 13.6% chronic energy deficient. This dual burden of malnutrition—where both undernutrition and overnutrition coexist—raises concerns about overall health and well-being and work output of Mahila Police.

Table 4.4: Nutritional Status among Mahila Police

Asia pacific BMI Classification	**n=191**	**%**
BMI (kg/m2)		
Choric Energy Deficient (<18.5)	26	13.6
Normal (18.5-22.9)	79	41.3
Overweight (23-24.9)	57	29.8
Obese (>25)	29	15.1

Prevalence of Anemia

Prevalence rate of anemia was also assessed using secondary source i.e. their reports done within one month of data collection that was self-reported by mahila police that is presented in **Table 4.5.** The mean hb levels were 10.8± 1.47 g/dl. Prevalence rate for anemia is 49% percent those who are mild anemic(11-11.9g/dl), followed by 43.1% who are moderately anemic(8-10.9g/dl) ,3.6% were severely anemic (<8g/dl) and 3.6% who are non-anemic with 12g/dl hb levels.

Prevalence of Hypertension

It was also found that most of the mahila police were normotensive (80%),17% were hypertensive and 2.61% falls under the category of hypotensive. Detailed information is depicted in **Table 4.6**

Physiological status of Mahila Police:

It was reported that 90% were non pregnant/non lactating and around 9% were lactating mothers (children<1 yrs)

Medical history of Mahila police

Table 4.7. represents medical history of Mahila Police. It was found that 93.2% of subjects have no allergies whereas 6.8% had allergies of certain foods such as wheat, soyabean, milk, sour foods. A small number of mahila police were suffering from diseases such as diabetes with (1%), hypertension with 2.6% and thyroid with1.6%. It was good to know that subjects are not practicing any kind of addiction such as alcohol or smoking only 1.6% of them were chewing tobacco.

Table 4.5 Prevalence of Anemia

Hemoglobin levels(self-reported)	**n=153**	**%**
Non anemic(12g/dl) 1	7	3.6
Anemic		
Mild (11-11.9)	76	49.6
Moderate (8-10.9)	66	43.1
Severe (<8)	7	3.6
Total	153	100

Table 4.6 Prevalence of Hypertension

Blood pressure (mmhg) levels of Mahila Police	**n=191**	**%**
Hypotensive (<90/60)	5	2.61
Normotensive (<120/80	153	80
Hypertensive >120/80 mmhg	33	17.2
Total	191	100

Table 4.7: Medical history (self-reported of Mahila police)

Particulars	n=191	%
Any allergies		
Yes	13	6.8
No	178	93.2
Total	191	100
Any disease?		
Diabetes	2	1
Hypertension	5	2.6
Thyroid	3	1.6
NA	181	94.7
Total	191	100
Addiction		
Yes	3	1.6
No	188	98.4
Total	191	100
If yes then,		
Ghutka	3	1.6
NA	188	98.4
Total	191	100

Knowledge of basic of nutrition and dietary practices among the Mahila Police

Information on basic of nutrition and dietary practices was also elicited to know their level of awareness. **Table 4.8** presents the knowledge of basics of nutrition among the Mahila Police. Participants were asked about their understanding of the fundamentals of nutrition and health. It was reported that only 21.4% had correct understanding of good health i.e. one who is mentally and physically fir without any disease.

Awareness of different food groups was reported by 92.14%. Specifically, 87.9% were aware of grains, 89% of white roots and tubers, 91.6% of milk and milk products, 77.4% of meat, fish, and poultry, 75.9% of eggs, 89% of vegetables, 92.14% of fruits, 25.13% of dark leafy greens, and 9.42% of nuts and oilseeds. None of the participants were aware of protective food group such as vitamin A-rich fruits and vegetables, and it was observed that only a few knew about dark leafy vegetables and nuts and oilseeds.

A balanced diet includes every food group and meets daily nutritional requirements. It was found that only 19% responded correctly. Further questions about the functions of foods were asked, 91% said food provides energy, 12% said it helps bodies grow, 37% said it increases immunity, and 41.3% said it keeps our bones healthy.

Whole grains, oil/ghee, sugar/jaggery help to provide energy. It was found that 72.2% identified whole grains, 17.8% identified oil/ghee, while 33.5% were unable to answer regarding these foods.

Foods required for muscle building include pulses and legumes, non-vegetarian options, and eggs. Pulses and legumes were identified by 72.7%, while 23.5% mentioned non-vegetarian options and eggs.

Foods that protect against disease include fruits and vegetables. The majority (69%) answered correctly, indicating they have adequate knowledge regarding the role of these foods in disease prevention.

The food group important for bones and joints is milk and milk products. It was reported that 67% identified milk and milk products, while the remaining respondents mentioned eggs/mutton/fish (20.9%) and pulses and legumes (19.8%).

Carbohydrates, proteins, and fats are major nutrients required in large quantities, while vitamins and minerals are considered micronutrients needed in small amounts for bodily functions. Only 24% responded correctly regarding carbohydrates, followed by 67.5% for proteins and 45.5% for fats.

Further inquiries about the effects of not consuming nutrients in required quantities revealed that 65% mentioned undernutrition; 44.5% cited overeating and obesity; 15.7% mentioned vitamin and mineral deficiencies; and 38.21% referred to non-communicable diseases (NCDs) such as diabetes and hypertension.

Table 4.8: Knowledge on basics of nutrition of Mahila Police

Particulars	**Pretest**	
	n=191	**%**
Knows about good health		
Disease free	145	75.9
able to do work	35	18.32
one who is mentally physically fit without any disease	41	21.4
Awareness about food groups		
yes	176	92.14
no	15	7.8
If yes, name the food groups		
Grains, white roots and tubers	168	87.9
milk and milk products	170	89
pulses and legumes	175	91.6
meat, fish, poultry	148	77.4
eggs	145	75.9
vegetables	170	89
fruits	176	92.14
Dark Glvs	48	25.13
nuts and oilseed	18	9.42
NA	4	2.09
knows correct definition of Balance diet		
Fully correct	38	19.89
Partially correct	173	90.5
Awareness about Functions of food		
providing energy	174	91
helping our bodies grow	23	12
increases immunity	74.3	38.9
keeping our bones healthy	79	41.3

Table 4.8: Knowledge on basics of nutrition among Mahila Police

Foods that helps to provide energy	**n=191**	**100%**
whole grains	138	72.2
oil/ghee	34	17.8
sugar/jaggery	64	33.5
don't know	8	4.1
Foods Require for muscle building		
pulses and legumes	139	72.7
non veg and egg	45	23.5
Foods that protects against diseases		
Fruits +vegetables	132	69
Cereals +pulses	56	29.3
don't know	4	2.09
Food group important for bones and joints		
pulses and legumes	38	19.8
egg/mutton/fish	40	20.9
milk and milk products	128	67
don't know	4	2.09
Major nutrients		
carbohydrate	46	24
protein	129	67.5
fats	87	45.5
vitamins	117	61.2
minerals	47	24.6
Effects of not consuming nutrients in required quantity		
undernutrition	125	65.4
overeating and obesity	85	44.5
deficiency of vitamins and mineral	30	15.7
NCD like diabetes etc	73	38.21

Knowledge about malnutrition among Mahila Police

Knowledge about malnutrition was assess which is presented in **Table 4.9**

Awareness of the term undernutrition was noted in 86.3%, with descriptions including low birth weight (31.4%), inability to work properly (65.9%), and being unhealthy (15.1%). Reasons for undernutrition included frequent illness (11.5%), poverty (76.4%), low birth weight (1.57%), lack of food (54.9%), and lack of awareness of what to eat (21.9%). Preventive measures for undernutrition were identified by 79.05% as consuming a balanced diet regularly and keeping homes and villages clean (19.3%). Awareness of the term overnutrition was noted in 65%, while 34.5% were not familiar with it. Consequences of malnutrition included lethargy (74.8%), low productivity (39.7%), and NCDs (39.2%). Consequences of overnutrition were also asked. It was observed that 73.8% identify diabetes, 35% cited blood pressure issues, 10.4% mentioning heart disease, and 1.5% referencing arthritis.

Table 4.9: Knowledge about malnutrition among Mahila Police

Sr. No	Particulars	n=191	%
1	**Awareness about undernutrition**		
	yes	165	86.3
	no	26	13.6
2	**if yes, describe undernutrition**		
	low weight for age	60	31.4
	can't work properly	126	65.9
	being unhealthy	29	15.1
3	**reasons of undernutrition**		
	frequent illness	22	11.5
	poverty	146	76.4
	low birth weight	3	1.57
	lack of food	105	54.9
	lack of awareness about what to eat	42	21.9
4	**preventive measures for undernutrition**		
	to consume balanced diet regularly	151	79.05
	to keep home and village clean	37	19.3

Table 4.9: **Knowledge about malnutrition among Mahila Police**

5	**Awareness about overnutrition**	**n=101**	**%**
	Yes	125	65%
	No	66	35%
6	**If yes, describe overnutrition**		
	obesity	111	58
	overeating and obesity	34	17.8
	being unhealthy	133	69.6
	NA	51	26.7
7	**Reasons for overnutrition**		
	stress	82	42.9
	overeating and obesity	105	54.9
	excess intake of nutrients	77	40.3
	don't know	4	2.09
8	**consequences of malnutrition**		
	lethargy	143	74.8
	low productivity	76	39.7
	NCDS	75	39.2
9	**what happens if you suffer from overnutrition?**		
	Diabetes	141	73.8
	blood pressure	67	35
	heart disease	20	10.4
	arthritis	5	1.5
	don't know	3	1.047

Knowledge about consumption of protective foods

Table 4.10 represents knowledge about consumption of protective foods. According to the WHO guidelines for a healthy diet in 2019, it is recommended to consume at least 400-500 grams of fruits and vegetables daily, 2 cups (500 ml) of milk or milk products, 6 teaspoons (25 grams) of sugar, and fats less than 30% of total energy. Respondents were asked about the quantity they should consume daily in standard cups and spoons, which refer to c1 (50 grams), c2 (70 grams), c3 (100 grams), and c4 (200 grams), while s1 refers to 2.5 ml (1/2 tsp), s2 refers to 5 ml (1 tsp), s3 refers to 7.5 ml (1/2 tbsp), and s4 refers to 15 ml (1 tbsp).

It was reported that 26.17% indicated a consumption of one fruit per day, while the recommended daily intake of vegetables varied: 400 grams (7.32%), 500 grams (6.28%), c1 (8.37%), c2 (2.09%), c3 (9.42%), and c4 (66.4%).

Regarding the quantity of fats and oils, 2.09% of the mahila police suggested consuming 4 teaspoons of oil and 2 teaspoons of ghee. The responses for fats included s1 (1.04%), s2 (14.6%), s3 (5.32%), and s4 (70.15%). For sugar, 0.5% recommended 4 teaspoons, while 32.4% referred to s2, 47.64% to s3, and 6.28% to s4.

When asked about the importance of breakfast, the mahila police responded that it keeps them active (83.7%) and improves attention and performance in the workplace (16.2%).

Table 4.10: Knowledge about consumption of protective foods

Sr.no.	Particulars	N=191	%
1	**Quantity of fruits you should consume in a day**		
	one	50	26.17
	two	118	61.7
	don't know	0	0
2	**Quantity of vegetables you should consume in a day**		
	400 gm	14	7.32
	500 gm	12	6.28
	Standard cup (c1)	16	8.37
	Standard cup (c2)	4	2.09
	Standard cup (c3)	18	9.42
	Standard cup (c4)	127	66.4
3	**Quantity of milk and milk products you should consume in a day**		
	500ml	14	7.3
	250 ml	159	83.24
4	**Quantity of fats/oil you should consume in a day**		
	4 tsp oil and 2tsp ghee	4	2.09
	Standard spoon (s1)	2	1.04
	Standard spoon (S2)	28	14.6
	Standard spoon (S3)	10	5.23
	Standard spoon (S4)	134	70.15
5	**Quantity of sugar you should consume in a day**		
	4tsp sugar	1	0.5
	Standard spoon (S2)	62	32.4
	Standard spoon (s3)	91	47.64
	Standard spoon (S4)	12	6.28
6	**Knows importance of breakfast**		
	Keeps you active	160	83.7
	improves attention and performance on workplace	31	16.2

Knowledge on causes and preventive measures on Anemia

Since anemia is a major public health problem in women, data on awareness about anemia, its causes and preventive measures was elicited and is presented in **Table 4.11.** It was found that 94.24% were aware about the term anemia and could describe as low hb in blood**.**

It was reported that 91% of mahila police suggested the causes of anemia as inadequate consumption of iron rich foods in the diet and to consume iron folic acid by 40% at baseline.

It was also found that 93.1% knows consumption of iron rich foods with enhancers and dietary diversity can be a preventive measure for anemia.

Signs and symptoms were also asked in which 94.2% said weakness,89% responded fatigue,87.9% said dizziness and 85% said headaches.

It was found that data on iron rich source foods was fairly good knowledge among mahila police officers whereas they had no knowledge to consume with regarding inhibitors and enhancers.

Table 4.11 Knowledge on causes and preventive measures of Anemia among mahila police

	Particulars	**n=191**	**%**
1	**Awareness on term anemia**		
	yes	180	94.24
	No	11	5.75
2	**If yes, describe Anemia**		
	low hemoglobin levels in the blood	174	91
	paleness of eyes, nails, tongue	104	54.4
	weakness	119	62.3
	NA	10	5.2
3	**Causes of Anemia**		
	Inadequate consumption of iron rich foods in the diet	167	87.4
	Consumption of iron rich foods with inhibitors like tea and coffee	8	4.2
	Excessive blood loss as in menstruation, delivery, hemorrhage	149	78.01
	blood loss during accidents	120	62.82

Table 4.11 Knowledge on causes and preventive measures of Anemia among mahila police

	Frequent Episodes of Malaria	12	6.28
4	**Signs and symptoms of Anemia**		
	Fatigue	170	89
	Weakness	180	94.2
	Pallor of skin, tongue and nails	117	61.2
	shortness of breath	106	55.4
	Dizziness	168	87.9
	brittle and spoon shaped nails	12	6.28
	Headache	163	85.3
	Tingling sensations in legs	58	30.3
	Don't know	10	5.2
5	**Preventive measures of Anemia**		
	Consumption of iron rich foods with enhancers and dietary diversity	178	93.1
	consume iron folic acid	78	40.8
	Cleanliness of house inside and outside	2	1.1
	Eat Purna shakti packets	49	25.65
	don't know	10	5.23
6	**Sources of iron rich foods**		
	Green leafy vegetables	38	19.9
	Whole cereals and pulses	11	5.8
	Dates	186	97.38
	Jaggery	58	30.36
	Egg/Meat/fish	49	25.65
7	**Foods to be consumed with iron rich foods**		
	vitamin C rich Foods-Amla/lemon/Orange/guava	0	
	Don't know	191	100
8	**Foods not to be consumed with iron rich foods**		
	Tea or coffee	0	
	Don't know	191	100

Knowledge about NCDs among Mahila police

Knowledge about NCDs among Mahila police was assessed. It was reported that 95.8% were familiar with the term NCDs. The common NCDs reported by the Mahila police included diabetes (86.9%), hypertension (77.6%), chronic lung disease (95.8%), and heart disease (77.6%), as depicted **in Table 4.12**

Regular physical activity and maintaining a healthy diet were reported by 92.14% and 61.7%, respectively, as preventive measures against NCDs.

Risk factors for diabetes and hypertension were also identified, with 95.28% attributing diabetes to genetics, followed by 37.69% who reported physical inactivity. For hypertension, 89% cited excessive consumption of HFSS food as a risk factor, followed by obesity (50.2%).

Table 4.12: Knowledge about NCDs among Mahila police

Sr no	Particulars	n=191	%
1	**Awareness on NCD**		
	Yes	183	95.8
	No	8	4.2
2	**If yes, describe common NCDs**		
	Diabetes	158	86.9
	Obesity	20	10.9
	Hypertension	142	77.6
	Heart Disease	27	14.8
	Cancer	63	34.8
	Chronic Lung Disease	183	95.8
	NA	8	4.18
3	**Comon risk factors of NCDS**		
	Unhealthy eating habits diet high in sugar and salt	158	86.3
	Diet low in Fruits and vegetables		
	Physical inactivity	86	47
	being Overweight/obese	52	29.3
	Addiction like tobacco, drug and alcohol	43	43.5
	stress	46	25.4
	Low consumption Of fruits and vegetables	0	0
	High consumption of HFSS	52	27.2
	Don’t know	8	4.18

Table 4.12: Knowledge about NCDs among Mahila police

4	**Prevention of NCDS**	**n=191**	**%**
	Maintaining a healthy body weight	65	34.03
	Be physically active regularly	176	92.14
	Maintain a healthy balance in your diet	118	61.7
	Do not include too much fat/sugar/salt in your diet	7	3.6
	Avoid tobacco use, drug and alcohol abuse	69	36.12
	Manage stress	46	24
	Don't know	2	1.04
5	**Risk factors for Diabetes**		
	Obesity	18	9.4
	genetics	182	95.28
	Physical inactivity	72	37.69
	Excessive consumption of HFSS Food	8	4.2
6	**Risk factors for Hypertension**		
	Obesity	96	50.2
	Lack of exercise	36	18.8
	Unhealthy diet	12	6.28
	Excessive consumption of HFSS Food	171	89.5

Knowledge on dietary diversity among Mahila Police

Dietary diversity is very important to achieve daily nutrition for women. Information was asked about whether they are familiar with the term dietary diversity. Information is presented in **Table 4.13.** It was found that almost all respondents were aware that dietary diversity meaning inclusion of variety of diet and food groups.

Dietary practices among mahila Police are presented in table 4.14

Information was also taken to understand their dietary practices; the type of diet was assessed. It was found that 82.1% of participants were vegetarian, while 17.9% were non-vegetarian. Additionally, questions regarding the frequency of eating junk food, preferences for dietary choices, money spent on junk food per day, and water consumption were posed. It was reported that 90.6% of respondents consumed junk food, with preferences including packed foods (89.5%), fried snacks (87.9%), carbonated drinks (54.9%), and sweets (67%). Furthermore, more than 100 rupees was spent on junk food by 86.3% of the mahila police. Regarding water consumption, 36.1% reported drinking 700-1 liter per day, 36.6% consumed 1-1.5 liters, 14% drank more than 1.5 liters, and only 3.6% consumed over 2 liters per day. Notably, 100% of respondents reported eating three main meals per day, which included breakfast, lunch, and dinner, according to the baseline data.

Table 4.13: Knowledge on dietary diversity among Mahila Police

Sr no	Particulars	n=191	%
1	**Describe diet diversity**		
	consuming variety of foods and food groups	186	97.4
	Focusing only on protein rich foods	15	7.9
2	**How to achieve diet diversity in daily life?**		
	variety of diet and food groups		
	Eat green leafy veg	186	97
	try new recipe and foods	22	11.5

Table 4.14 Dietary practices among mahila Police

Sr. no.	Particulars	n=191	%
1	**Type of your Diet**		
	vegetarian	157	82.1
	Non vegetarian	34	17.8
	total	191	100
2	**Buying junk foods**		
	yes	173	90.6
	NO.	18	9.4
	Total	191	100
3	**If yes, describe your preference**		
	Packed snacks	171	89.5
	Fried snacks	168	87.95
	Carbonated Drinks	105	54.9
	Sweets	128	67
	NA	16	8.37
4	**If yes, money spent in a day to buy junk food**		
	<100 rs	24	13.7
	100-200	151	86.3
5	**Water Consumption**		
	700-1 lt	69	36.1
	>1-1.5 lt	70	36.6
	>1.5 lt	27	14.1
	>2 ltrs	7	3.6
	Total	191	100
6	**Frequency junk food**		
	once		
	twice	89	46.5
	thrice	102	53.4
	Total	191	100

Table 4.14 Dietary practices among mahila Police

7	**meals in a day**	**n=191**	**%**
	Breakfast	191	100
	brunch	2	1.04
	lunch	191	100
	evening snack	1	1.04
	Dinner	191	100
	supper	2	1.04

Dietary diversity

Food groups consumed and Minimum Dietary Diversity for Women (MDD-W) of Mahila Police from 24 hr. dietary recall

To find out the variety of diet consumed by mahila police, one day 24 hr. dietary recall was used to collect data on food consumption. Based on the food groups consumed on previous day, Minimum Dietary Diversity for Women (MDD-W) was calculated using **FANTA USAID (2016)** guideline. Data is presented in **Table 4.15 and 4.16**

It was observed from the data that all the members ate staple food i.e. wheat. Hundred percent of Mahila Police reported for pulse consumption. Protective rich foods like Vitamin A rich fruits and dark leafy vegetables consumed by only 3.1% and 21% of the respondents. Dairy products were consumed by 94.1% followed by fruits (20.9%) and vegetables (97.9%).it was observed that very few of them were having nuts and oilseed (13.6%) in their diet.

Minimum Dietary Diversity for Women (MDD-W) was found to be in 45% of the mahila police as they reported consumption of 5 or more food groups on the day of data collection.

Table 4.15 Number of Food groups consumed by Mahila Police

Sr no.	Particulars	n=191	%
1	**Food groups consumed by Mahila Police**		
	Grains, white root tubers and plantains	191	100
	eggs	17	8.9
	dairy	181	94.7
	Dark leafy vegetables	40	21.1
	Pulses and legumes	191	100
	Other vitamin A rich fruits and vegetables	6	3.1
	Other fruits	40	20.9
	Meat poultry and fish	26	13.6
	Other vegetables	186	97.9
	Nuts and seeds	26	13.6

Table 4.16: Minimum Dietary Diversity for Women (MDD-W) of Mahila Police from 24 hr. dietary recall

Sr. No.	Particulars	n=191	%
1	**Food groups consumed**		
	≥5	86	45
	<5	105	54.9
	Total	**191**	**100**

Physical activity of mahila Police

Regular physical activity is essential for police officers, enhancing their overall health, job performance, and capacity to manage challenging situations. This, in turn, promotes both officer well-being and community safety. Information on physical activity is shown in **Table 4.17**

It was found that 30.4% of participants had a fitness regimen that included daily gym or yoga classes at baseline. Additionally, it was reported that 83.2% commute by two-wheeler, 6.3% by four-wheeler, 7.9% walk, 1.6% use rickshaws, and 1% rely on government transport.

It was observed that everyone participates in a parade once a week as part of police exercise.

The majority of the mahila police reported to handle household activities such as cleaning utensils, mopping, sweeping, cooking, washing clothes, and taking care of children on their own. It was reported that 56% wake up between 4 and 7 a.m., followed by 43.5% who wake up between 7 and 10 a.m., and 0.5% who wake up between 10 a.m. and 12 p.m. Their sleep patterns were also assessed by inquiring about their sleeping and waking times, revealing that 77.5% sleep more than 8 hours, while 23% sleep less than 8 hours.

Time spent on social media was assessed by asking about their screen time on phones. The results showed that 66.5% spend 1-2 hours, while 33.5% spend more than 2 hours, which may be harmful to their mental health and well-being.

Table 4.17 Physical activity of Mahila Police

Sr.no.	Particulars	n=191	%
	Physical activity		
1	Any fitness regime, Gym/yoga/fitness club		
	Yes	58	30.4
	No	133	69.6
2	**Do you go walking or jogging after office hours**		
	Yes	55	28.8
	No	136	71.2
3	**Mode Of transport**		
	2-wheeler	159	83.2
	4-wheeler	12	6.3
	Government transport	2	1
	Rickshaw	3	1.6
	Walking	15	7.9
4	**police officer exercise**		
	Parade	191	100
5	**How many days you exercise in a week**		
	3-5 days	8	4.2
	>5 days	24	12.6
	NA	159	83.2
6	**Time spent on sitting/reclining**		
	<8 hrs	68	35.6
	>8hrs	123	64.39
7	**Household activities done by you**		
	Cleaning utensils	169	88.9
	Mopping and sweeping	170	89.5
	Cooking	177	93.2
	Washing clothes	169	89.4
	Taking care of children	81	42.6
	None	8	4.2
8	**Maid at house**		
	Parttime	15	7.9
	Fulltime	2	1
	None	174	91.5

Table 4.17 Physical activity of Mahila Police

9	**Wake up time**	**n=191**	**%**
	4-7 am	107	56
	7-10 am	83	43.5
	10am-12pm	1	0.5
10	**Sleeping time**		
	Before 11 pm	43	22.5
	After 11 pm	148	77.5
11	**Time spent on social media**		
	1-2hr	127	66.5
	>2 hrs.	64	33.5

Highlights of the findings -Section 1

Socio-Demographic Profile of Mahila Police:

Total 191 Mahila police from 12 police stations were enrolled from urban Vadodara for the study.

The mean age of the Mahila Police was 32 ± 7.56 years.

Around 61% completed their graduation followed by 30% with post-graduation degrees (29.8%), and 9.4% have studied up to higher secondary level.

Approximately 86.3% of the Mahila Police belonged to reserved categories.

41.3% fall under the normal BMI category the normal weight category, while 29.8% were overweight, 15.1% were obese, and the remaining 13.6% were chronic energy deficienct as per Asia pacific BMI classification 2007.

Abdominal obesity was found in 36 respondents (19%).

The mean hb levels were 10.8±1.47 SD g/dl with 49% percent those who were mild anemic(10-12g/dl), followed by 43.1% moderately anemic(7-9g/dl) ,3.6% were severely anemic (<7g/dl) and 3.6% were non-anemic with >12g/dl hb levels.

Knowledge and dietary practices among Mahila police

Only 21.4% had correct understanding of good health. Awareness of different food groups was reported by 92.14%.

Awareness of the term undernutrition was noted in 86.3%, with descriptions including low birth weight (31.4%), inability to work properly (65.9%), and being unhealthy (15.1%).

Awareness of the term overnutrition was noted in 65%, while 34.5% were not familiar with it.

91% of mahila police suggested the causes of anemia as inadequate consumption of iron rich foods in the diet and to consume iron folic acid by 40% at baseline.

90.6% of respondents consumed junk food, with preferences including packed foods (89.5%), fried snacks (87.9%), carbonated drinks (54.9%), and sweets (67%).

Protective rich foods like Vitamin A rich fruits and dark leafy vegetables consumed by only 3.1% and 21% of the respondents

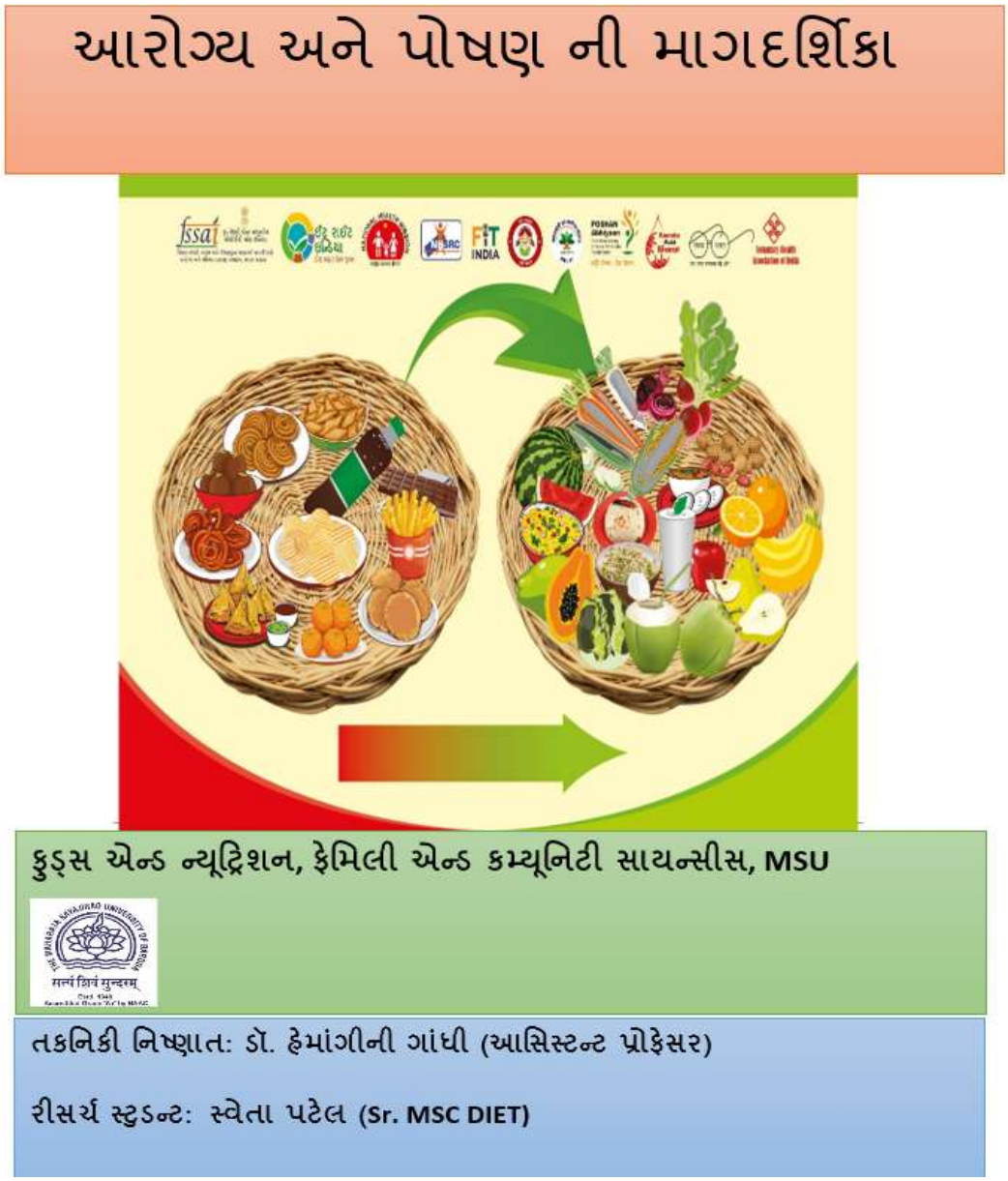
Minimum Dietary Diversity for Women (MDD-W) was found to be in 45% of the mahila police as they reported consumption of 5 or more food groups from 24 hr dietary recall

Section II – Sensitization of Mahila police with IEC material on concepts of Nutrition and health among Mahila Police

- Development of training module and PowerPoint presentation
- Sensitization of Mahila police on topics of nutrition and health for 8 weeks (once a week for 1-2 hours)

Based on knowledge of Nutrition and dietary practices among Mahila police, topics were identified for the orientation to them. A training module was developed for mahila police. Power point presentations were made to give them counselling every week for 8 weeks.

Training module:



PowerPoint presentations for sensitizing mahila police:

Index

Sensitization of Mahila police on nutrition and health.

In all, 12 Police station and 191 mahila police were enrolled for the study. Out of which 6 Police station were randomly selected for intervention. Total of 101 Mahila police of 6 police station served as experimental group and 90 Mahila police of another 6 police station served as control group. All the mahila police attended all the eight sessions.

As per the experimental design a total of 101 Mahila police were given counselling sessions for 8 weeks (once a week for 1-2 hours) on topics of Basics of Nutrition and health, Concept of healthy diets and Dietary diversity, Importance of micronutrients for the body, Anemia and its prevention, NCDs, Consequences of junk foods, Importance of Physical Fitness, Advantages and disadvantages of social media on food consumption in the month of December,2024 to February,2024.

Ppts were made for counselling. WhatsApp group was created and soft copies of the same were posted for their reference

After imparting all the 8 sensitization sessions among mahila police, a revision class was conducted in which all the topics were discussed in brief. To evaluate the impact of the training post data was collected on their knowledge retention related to Nutrition and food groups among Mahila Police, malnutrition, consumption of protective food groups, anemia, NCDs, dietary diversity, change in dietary practices, Minimum Dietary Diversity of Women (MDD-W) of Mahila Police, food groups consumed, change in Physical Activity patterns. Sessions were conducted in hybrid mode.

Highlights of the findings of Section II

A total of 101 Mahila police from 6 police station were given counselling sessions for 8 weeks (once a week for 1-2 hours) through Ppts and training module in hybrid mode.

Total 8 sessions and 1 revision session for counselling was conducted

Section III- Impact Evaluation

Knowledge retention on Nutrition and food groups Among Mahila Police

Information on basics of nutrition and food groups was elicited to know their level of awareness.

Table 4.18 presents the knowledge on basics of nutrition among the Mahila Police. The data indicates a significant difference between pre and post counselling knowledge levels in certain aspects.

Good health

Initially, only 22.7% of the pre-experimental group had correct understanding of good health i.e. one who is mentally physically fit without any disease, while after counseling, 100% of the post-experimental group exhibited this knowledge. The control group did not show any improvement regarding understanding of good health against experimental group**. (Figure 4.1)**

Food groups required for daily diet:

The FANTA classification of food groups comprises ten categories. Understanding of basic food groups like cereal, pulses, milk and milk products, non veg foods, vegetables, fruits was found in majority of respondents at baseline. After 8 weeks of sensitization, it was found that almost all experimental group could identify dark leafy green vegetables, nuts and oilseed, vit A rich fruits and vegetables as one of the food groups as compared to control group. The difference was found to be significant.

Balanced diet:

Post intervention, significant improvement was seen in answering correct definition of balanced diet by experimental group which increased from 25% to 100%. In control group correct knowledge about balanced diet was found only in 16.5%. **(Figure 4.2)**

Functions of food:

Energy giving function of foods was reported by 94% in experimental group and 88% in control group at baseline, body building function was reported only by 19.8% in experimental group and 38% respondents. At end line in experimental group, body building function of food was reported by 56.7% (19.8% to 56.7%) whereas no improvement seen in control group.

Foods providing energy:

Further foods that help provide energy, such as whole grains and oil/ghee, were identified by 90.3% and 26.9% of participants, respectively. Eight percent of the pre-experimental group did not know which foods provide energy. In this group, no one responded regarding sugar and jaggery as energy sources. However, in the post-experimental group, after sensitization, an improvement in knowledge was observed, with 90.9% identifying whole grains, 96.9% identifying oil/ghee, and 96.9% mentioning sugar and jaggery. In the pre-control group, 60% responded for whole grains, 14.4% for oil/ghee, and 71.1% for sugar and jaggery. In contrast, in the post-control group, 74.4% answered for whole cereals, 40% for oil/ghee, and only 1.4% for sugar/jaggery

Foods for body building

Foods that help in muscle building include pulses, legumes, non-vegetarian options, and eggs. About 87% and 27% identified pulses and legumes and non-vegetarian options, respectively, in the pre-experimental group. In the post-experimental group, 98% mentioned pulses and legumes, while 93.1% identified non-vegetarian option and eggs. Only 0.9% did not know the answer, showing increased knowledge after counseling. In the pre-control group, 57.7% identified pulses, and 23.1% identified non-vegetarian options and eggs. In the post-control group, 68.8% identified pulses and legumes, while 25% mentioned non-vegetarian options and eggs, with 2% unable to identify foods for muscle building.

Foods for disease prevention:

Foods that protect against diseases include fruits and vegetables. Interestingly, in the pre-experimental group, 79.5% identified fruits and vegetables, while 35.2% mentioned cereals and pulses, and 2% were unable to answer. In the post-experimental data after sensitization, 100% were able to provide the correct answer, demonstrating significant improvement in their knowledge. In the pre-control group, 68.6% identified fruits and vegetables, 27.3% identified cereals and pulses, and 2% did not know the correct answer. In the post-control group, 68% identified fruits and vegetables, 26.7% mentioned cereals and pulses, and 4% were unable to provide a correct answer.

(Figure 4.3)

Food groups for bone health:

Three-fourths of the Mahila Police (76%) provided the correct answer, while 15% answered egg, fish, or mutton, and 30.3% mentioned pulses and legumes. Only 2% were unable to provide an answer in the pre-experimental group. After counseling, 100% gained knowledge as against 66.2% in the pre-control group. In the post-control group, 68.6% provided the correct answer, while 26.7% mentioned egg, mutton, or fish, followed by 14% who responded with pulses and legumes. Four percent were unable to identify the correct food groups. For bone health

Nutrients required in daily diet:

Major nutrients in the diet include carbohydrates, proteins, and fats, while micronutrients consist of vitamins and minerals. It was surprising to find that 73.3% identified vitamins and 21% identified minerals as major nutrients in the pre-experimental group. Only 34.7% answered carbohydrates, 62.4% said pulses, and 7.9% answered fats. After sensitization, experimental group gained knowledge about major nutrients, with 100% correctly identifying carbohydrates, proteins, and fats (93.1%) in the post-experimental group. In the pre-control group, 73.3% identified protein, 13.9% mentioned carbohydrates, 7.9% identified fats, 54.4% mentioned vitamins, and 32.9% identified minerals. In the post-control group, 54.4% identified vitamins, 28.8% identified minerals, 20% identified carbohydrates, 8.1% identified protein, and 1.1% identified fats. This indicates that Mahila Police had poor knowledge of major nutrients before sensitization, which showed significant improvement following the intervention**. (Figure 4.4)**

Table 4.18 Knowledge on basics of nutrition among Mahila Police

		PRE		POST		
Sr.no		Experimental (n=101)	Control (n=90)	Experimental (n=101)	Control (n=90)	
	Particulars	%	%	%	%	P value
1	Knows about good health					
	Disease free	70.2	93.7	0	88.9	6E-27*
	Able to do work	16.8	22.8	0	20	2E-06*
	One who is mentally and physically fit without any intervention	22.7	22.8	100	25.6	8E-12*
2	Awareness about food groups					
	yes	98	85.5	100	95.6	8E-01*
	no	2	14.4		4.4	1E-01*
3	If yes, name the food groups					
	Grains, white roots and tubers	91.9	85.5	100	95.5	8E-01*
	milk and milk products	93.9	85.5	100	95.5	8E-01*
	pulses and legumes	94	88	100	95.5	8E-01*
	meat, fish, poultry	85.9	81.8	100	80	2E-01*
	eggs	81.8	83.1	96	81.4	3E-01*
	vegetables	93.9	85.5	100	95.5	8E-01*
	fruits	98	85.5	100	95.5	8E-01*
	Dark Glvs	30.3	23.4	92	29.1	8E-01*
	nuts and oilseed	16.2	2.6	100	5.8	5E-24*
	Vit A rich fruits and vegetables	0	0	100	0	2E-30*
	NA	1.98	2.3	0	4.44	1E-01
	knows correct definition of Balance diet					
	Fully correct	24.8	16.5	100	23.3	1E-12*
	Partially correct	96	96.2	0	93.3	2E-28

***p<0.05**

Table 4.18 Knowledge on basics of nutrition among the Mahila Police.

5	**Awareness about Functions of food**	**%**	**%**	**%**	**%**	**P value**
	providing energy	94.1	87.7	100	100	1E+00
*	helping our bodies grow	19.8	3.8	56.4	0	3E-17*
*	increases immunity	69.3	80	81.2	84.4	9E-01*
	keeping our bones healthy	0	87.7	0	3.3	3E-01*
6	**Foods that helps to provide energy**					
	whole grains	90.3	60	97	74.4	9E-02*
	oil/ghee	26.9	14.1	96.9	40	2E-06*
	sugar/jaggery	0	71.1	96.9	1.4	3E-26*
	don't know	7.9	0	2.97	17	7E-04*
7	**Foods Require for muscle building**					
	pulses and legumes	87	57.7	98	68.8	2E-02*
	non veg and egg	27	23.1	93.1	25	2E-10*
	don't know	1	0	0.9	2.22	3E-01*
8	**Foods that protects against diseases**					
	Fruits +vegetables	79.8	68.8	100	64.4	6E-03*
	Cereals +pulses	35.4	27.3	0	26.7	3E-08 *
	don't know	2	2		4.44	
9	**Food group important for bones and joints**					
	pulses and legumes	30.3	10.4	0	14	1E-04*
	egg/mutton/fish	15.2	32.5	0	26.7	3E-08*
	milk and milk products	77.8	66.2	100	68.6	2E-02*
	don't know	2	0	0	4	
10	**Major nutrients**					
	carbohydrate	34.7	13.9	100	20	6E-14*
	protein	62.4	73.3	100	8.1	2E-21*
	fats	7.9	7.9	93.06	1.1	1E-26*
	vitamins	73.3	54.4	0	54.4	1E-16*
	minerals	20.8	32.9	0	28.9	7E-09*

***p<0.05**

Figure 4.1 Knowledge on correct perception of good health

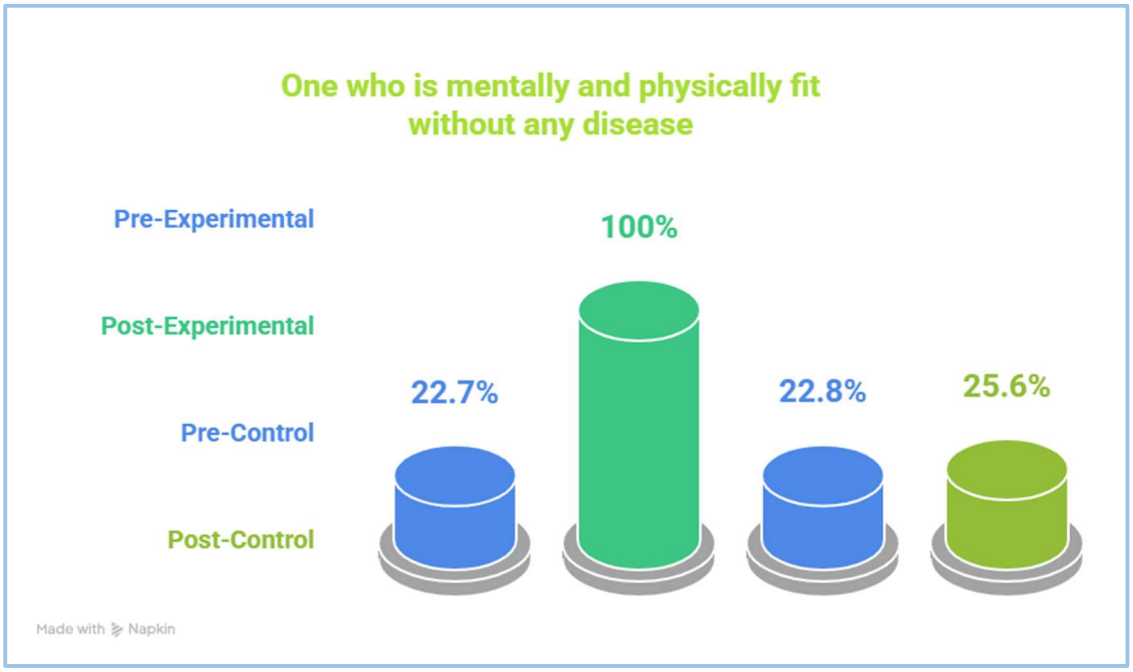


Figure 4.2 Knowledge on balanced diet

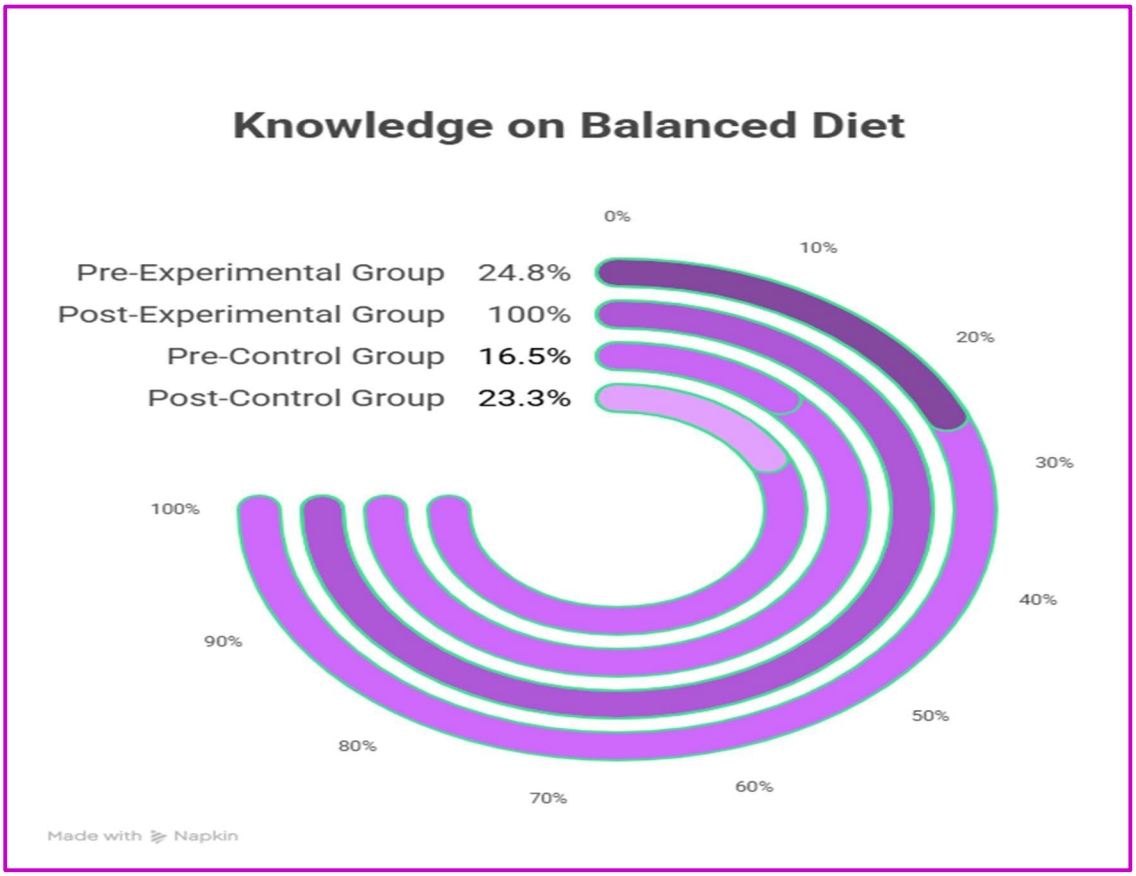


Figure 4.3 Knowledge on foods that protects against diseases.

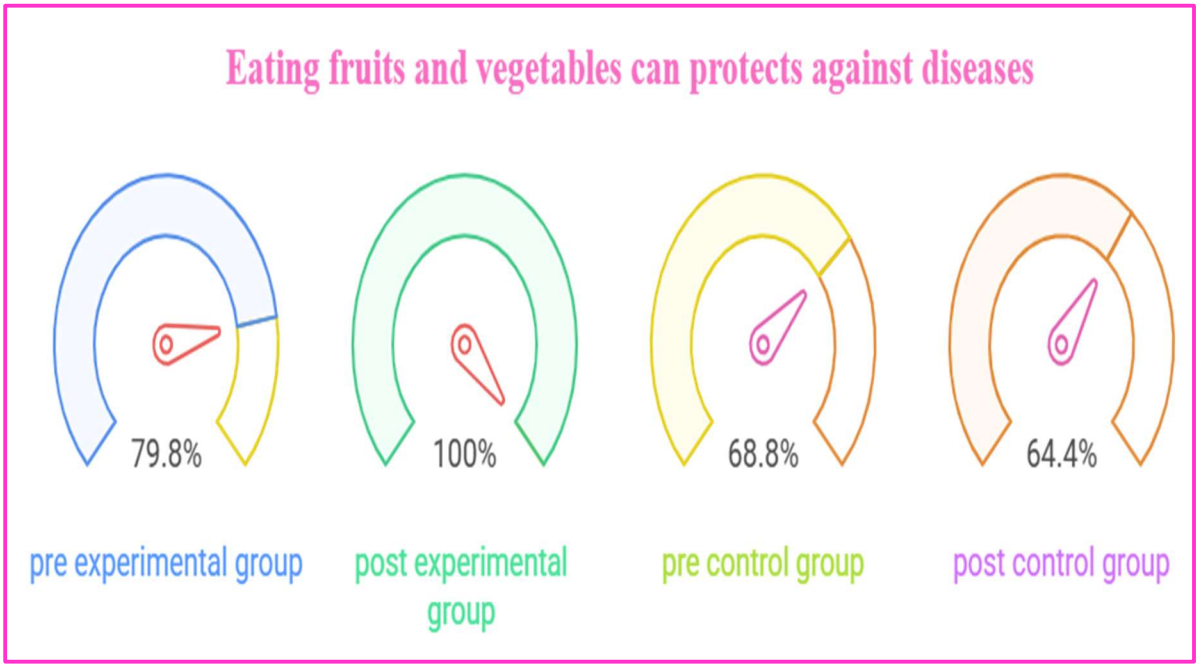
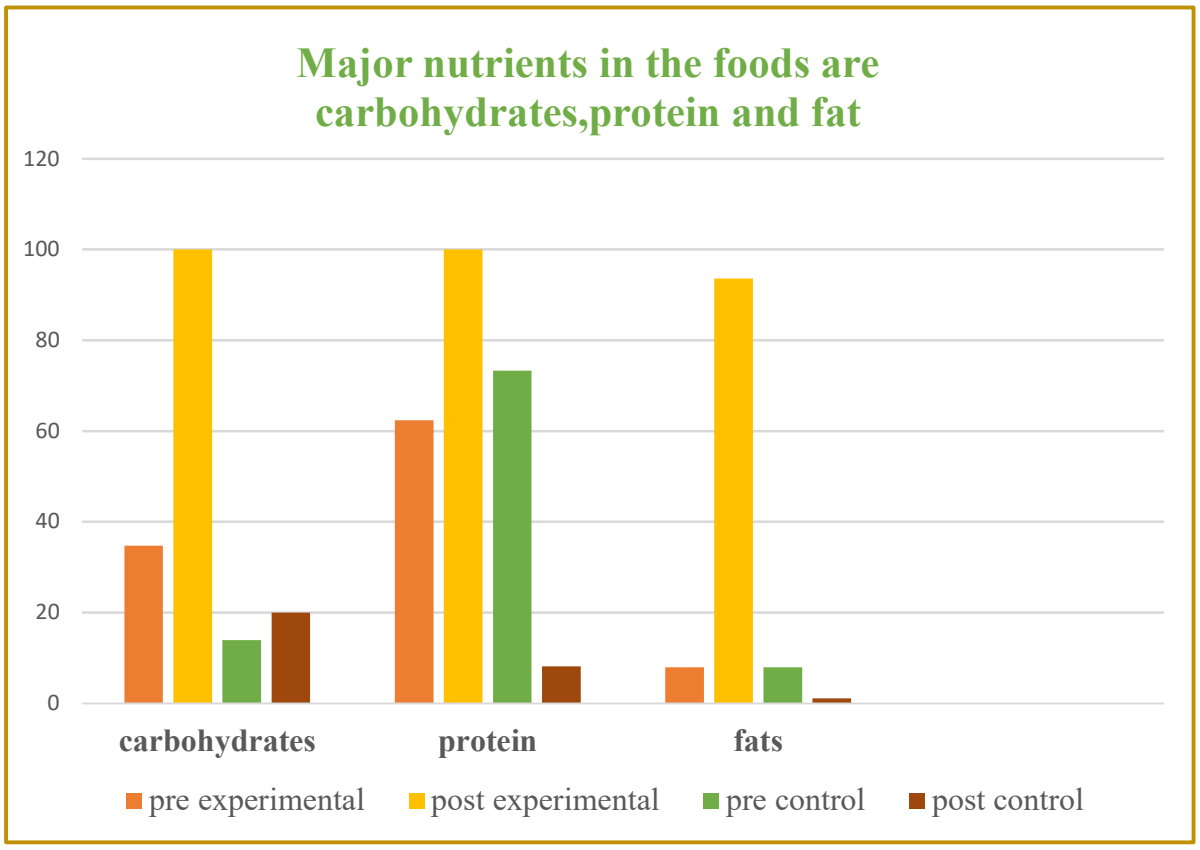


Figure 4.4 Knowledge on major nutrients of the foods.



Knowledge retention on Malnutrition among Mahila Police

Information on Malnutrition was also elicited, including the effects of not consuming nutrients in the right quantity, undernutrition, overnutrition, and malnutrition is depicted **in Table 4.19**.

Effects of not consuming nutrients

The perception of the effects of not consuming nutrients in the right quantity was reported as undernutrition (55.4%), non-communicable diseases (NCDs) such as hypertension and diabetes (50.5%), deficiency of vitamins and minerals (15.8%), and overeating (5.9%) in the pre-experimental group before training. In the post-experimental group, after sensitization, respondents reported knowledge gains, with 100% recognizing undernutrition, overeating, and vitamin and mineral deficiencies, while 92.1% cited NCDs like hypertension and diabetes. In the pre-control group, 76.6% reported undernutrition, 87.7% recognized overeating and obesity, 22% identified NCDs like hypertension and diabetes, and 14% noted vitamin and mineral deficiencies. In the post-control group, no improvement was seen except 41% answered NCDs as effects of not consuming enough nutrients. (25% to 45%) (**Figure 4.5)**

Awareness about the term Undernutrition:

Further awareness about undernutrition was assessed, revealing that 93.1% of the pre-experimental group was aware of undernutrition, while 6.9% were not. After counseling sessions, 94% of the experimental group gained knowledge, resulting in improvement in the post-experimental group, while the remaining 6% remained unaware. In the pre-control group, 78.5% were aware, and 21% were not. In the post-control group not, much improvement was observed.

What is undernutrition?

Respondents in the pre-experimental group described undernutrition as low birth weight for age (22.8%), inability to work properly (74.8%), and being unhealthy (22.8%). In the pre-control group, 46.8% identified low weight for age, 64.6% cited inability to work properly, and 7.6% noted being unhealthy. After counseling sessions, significant improvement was observed in the post-experimental group, with 100% recognizing undernutrition and inability to work properly, followed by 22.8% noting being unhealthy. In the post-control group not much change was observed.

Reasons for undernutrition

It includes frequent illness, lack of food, poverty, and low birth weight. In the pre-experimental group, approximately 80% cited poverty, 50% identified lack of food, 25.7% noted lack of awareness about what to eat, and 17.8% mentioned frequent illness. In the post-experimental group, increased knowledge was observed after training, with 62.4% citing frequent illness, 93.1% poverty, 55.4% low birth weight, 76.2% lack of food, and 25.7% lack of awareness about food. In the pre-control group, 82.3% reported poverty, 60% identified lack of food, 20.3% noted lack of awareness about what to eat, and 5% cited frequent illness. In the post-control group, 10% mentioned frequent illness, 85.6% identified poverty, 71.1% noted lack of food, and 3.3% acknowledged low birth weight, while 33.2% cited lack of awareness about food. No significant difference was found in the control group between pre- and post-assessments compared to the post-experimental group**. (figure 4.6)**

Preventive measures for undernutrition include consuming a balanced diet regularly. It was reported that 81.2% of respondents answered this correctly, while 30.7% suggested keeping homes and villages clean, and 2.97% were unable to answer in the pre-experimental study. In the post-experimental group, 100% answered correctly after training. In the pre-control group, 76.6% responded with consuming a balanced diet regularly, 7.6% suggested keeping homes and villages clean, and 2.2% were unable to answer. No improvement in knowledge was observed in post control group.

Overnutrition:

More than half of the respondents (64%) in the pre-experimental group were aware of the term "overnutrition," while 35.6% were unaware. In the pre-control group, 66.6% had awareness of overnutrition, and 26% were unaware. After counseling was provided to the experimental group, a significant difference in knowledge levels was reported, with 100% awareness in the post-experimental group. In contrast, 77.8% in the post-control group were aware of overnutrition, and 22.2% were unaware.

What is overnutrition?

Overnutrition is described as obesity, overeating, and being unhealthy. Only half of the Mahila Police identified obesity (57.8%); overeating was recognized by only 14.28%, and being unhealthy was identified by 65.4%. Thirty-five percent were unable to answer. In the pre-control group, 58.8% identified obesity, 21.1% recognized overeating, and 68.8% identified being unhealthy, with 16.6% unable to respond. After the training, 100% reported overnutrition as overeating, obesity, and being unhealthy. In the post-control group, 68.8% identified obesity, 26.6% recognized overeating, and only 1.4% identified being unhealthy as overnutrition. However, not much difference was found between the post-control group

Reasons for overnutrition

Half of the subjects in the pre-experimental group identified stress (53.5%), overeating, and obesity (56%) as reasons for overnutrition. In the post-experimental group, knowledge improved significantly, with 100% of respondents reporting stress, overeating, and excess intake of nutrients, respectively, after counseling sessions. In the pre-control group, 85.5% identified excess intake of nutrients, 55.5% recognized overeating and obesity and 32.2% identified stress. In the post-control group, overeating and obesity by 64.45%, stress was identified by 38.8% and excess intake of nutrients by 1.2%. **(Figure 4.7)**

consequences of overnutrition

Further consequences of overnutrition include diabetes, high blood pressure, heart disease, and arthritis. In the pre-experimental group, the majority of officers identified diabetes (78%), high blood pressure (46%), heart disease (10%), and arthritis (2%), with 1% unable to respond. In the post-experimental group, 100% identified diabetes, high blood pressure, heart disease, and arthritis, indicating a significant improvement in knowledge. In the pre-control group, 80.8%reported diabetes, 26.9% identified high blood pressure, 12.8% recognized heart disease, and 1.3% identified arthritis, with another 1.3% unable to answer. In the post-control group, 80.7% identified diabetes, 38.6% identified high blood pressure, 20.5% recognized heart disease, and only 2% were unable to answer.

Consequences of malnutrition

It includes lethargy, low productivity, and non-communicable diseases (NCDs). In the pre-experimental group, 71% identified lethargy, 43% recognized low productivity, and 48.5% identified NCDs. In the post-experimental group, 71.3% identified lethargy, and 42.6% stated low productivity and 52% reported NCDs. In the pre-control group, 90% identified lethargy, 40.5% recognized low productivity, and 32.5% identified NCDs. In the post-control group, 83.3% answered lethargy, 52.3% identified low productivity, and 30% recognized NCDs. There was not much difference observed between the control and experimental groups, as knowledge levels remained similar despite counseling. They had adequate knowledge on consequences even begore counselling.

Table 4.19: Knowledge about Malnutrition among mahila Police *p<0.05

		PRE		POST		
		Experimental (n=101)	Control (n=90)	Experimental (n=101)	Control (n=90)	
Sr.no	Particulars	%	%	%	%	P value
1	**Effects of not consuming nutrients in required quantity**					
	undernutrition	55.4	76.6	100	77.8	1E-01*
	overeating and obesity	5.9	87.7	100	100	1E+00
	deficiency for vitamins and mineral	15.8	17.7	100	18.9	6E-15*
	ncd like diabetes etc.	50.5	24.4	91.1	45	1E-04*
	don't know					
2	**Awareness about undernutrition**					
	yes	93.1	78.8	94	84.4	5E-01*
	no	6.9	21	5.9	15.6	3E-02
3	**If yes, describe undernutrition**					
	low weight for age	22.8	46.8	100	44.4	3E-06*
	can't work properly	74.3	64.6	100	67.8	1E-02*
	being unhealthy	22.8	7.6	22.8	14.4	3E-01*
4	**Reasons of undernutrition**					
	frequent illness	17.8	5.1	62.4	10	3E-10*
	poverty	80.2	82.3	93.1	85.6	6E-01*
	low birth weight	2	1.3	55.4	3.3	2E-13*
	lack of food	50.5	60	76.2	71.1	7E-01*
	lack of awareness about what to eat	25.7	20.3	25.7	33.2	4E-01*
5	**preventive measures for undernutrition**					
	to consume balanced diet regularly	81.2	76.6	100	86.7	3E-10*
	to keep home and village clean	30.7	7.6	-	6.7	3E-02*

Table 4.19: Knowledge about Malnutrition among mahila Police

6	**Awareness about overnutrition**	**%(n=101)**	**% (n=90)**	**%(n=101)**	**%(n=90)**	P value
	Yes	64	66.6	100	77.8	1E-01*
	No	35..6	33%	-	22.2	5E-07
7	**If yes, describe overnutrition**					
	obesity	57.4	58.8	100	68.8	2E-02*
	overeating	14.8	21.1	100	26.6	2E-11*
	being unhealthy	65.34	68.8	100	1.4	8E-29*
	NA	35.6	16.6	-	20	
8	**Reasons for overnutrition**					
	excess intake of nutrients	-	2.2	100	1.2	8E-29*
	overeating and obesity	56.1	55.5	100	64.4	6E-03*
	stress	53.5	32.2	100	38.8	1E-07*
	don't know	2.22	2.22	0	4.44	
10	**what happens if you suffer from overnutrition?**					
	Diabetes	78	70	100	78.8	2E-01*
	blood pressure	46	26.9	100	38.6	1E-07*
	heart disease	10	12.8	100	20.5	6E-14*
	arthritis	2	1.3	100	0	2E-30*
	don't know	1	1.3	0	2.22	
9	**consequences of malnutrition**					
	NCDS	48.5	32.9	51.4	30	3E-02*
	low productivity	43.6	40.5	42.6	53.3	3E-01*
	lethargy	71.3	89.9	71.3	83.3	4E-01*

***p<0.05**

Figure 4.5 Knowledge on effects of not consuming enough nutrients

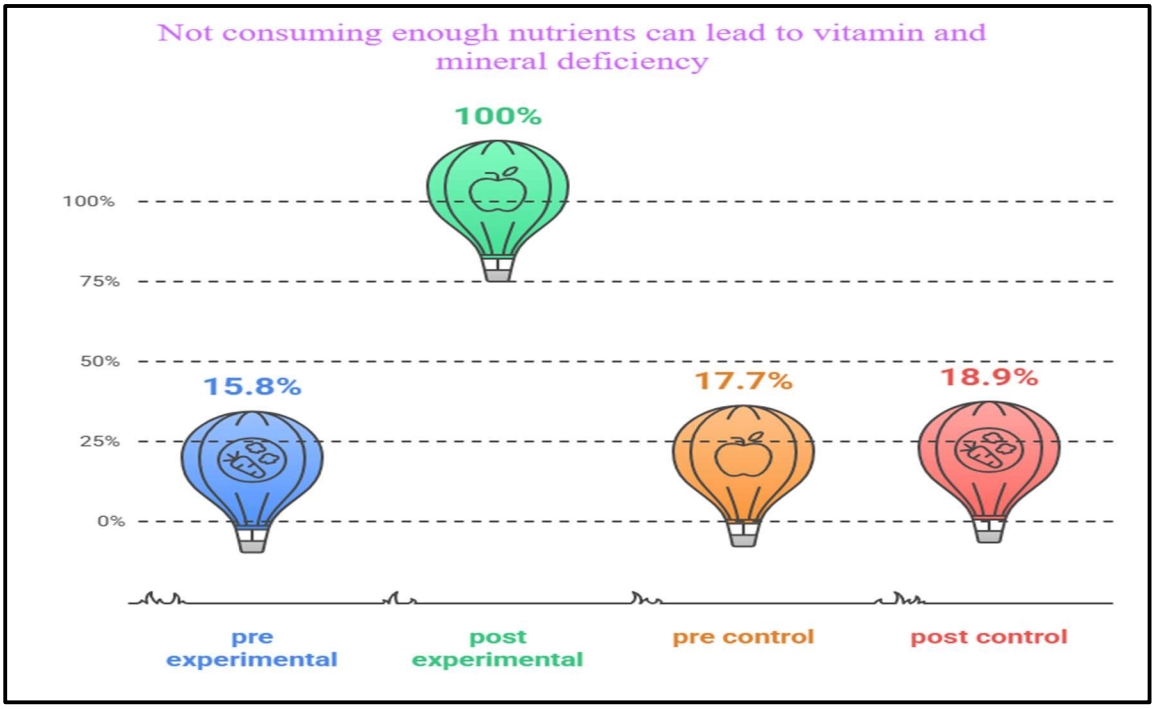


Figure 4.6 Knowledge on reasons of undernutrition

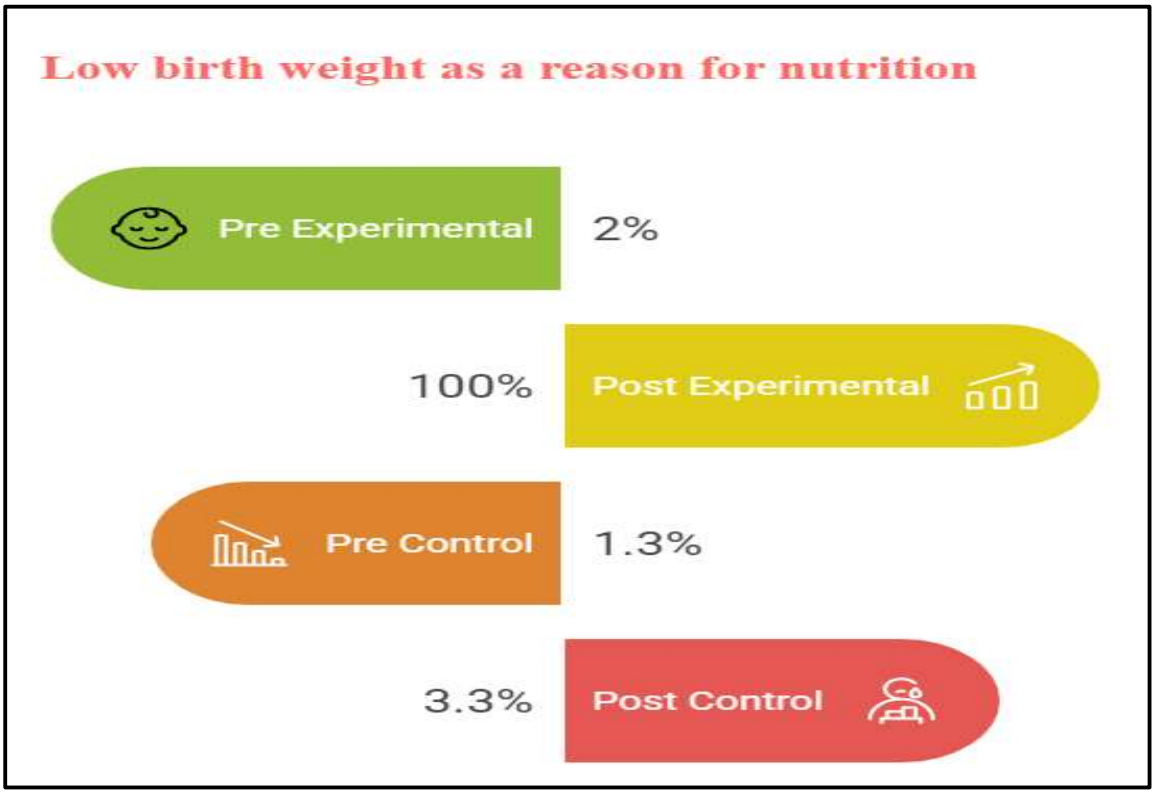
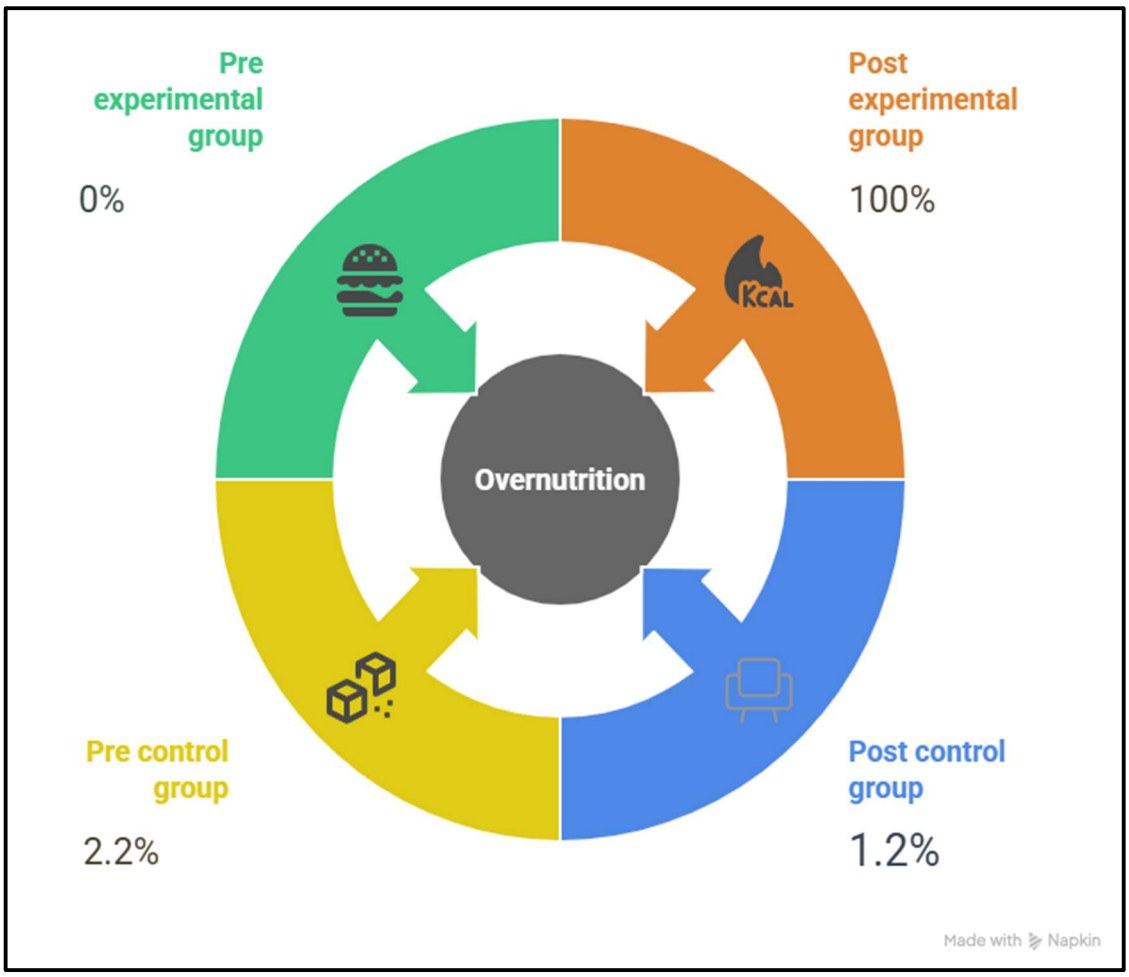


Figure 4.7 Knowledge on Reasons of overnutrition

Excess intake of nutrients can be a reason of overnutrition



Knowledge retention about consumption of protective food groups

According to the WHO guidelines for a healthy diet in 2019, it is recommended to consume at least 400-500 grams of fruits and vegetables daily, 2 cups (500 ml) of milk or milk products, 6 teaspoons (25 grams) of sugar, and fats less than 30% of total energy. Knowledge about consumption of protective food groups was asked to the respondents about the quantity they should consume daily in standard cups and spoons, which refer to c1 (50 grams), c2 (70 grams), c3 (100 grams), and c4 (200 grams), while s1 refers to 2.5 ml (1/2 tsp), s2 refers to 5 ml (1 tsp), s3 refers to 7.5 ml (1/2 tbsp), and s4 refers to 15 ml (1 tbsp) which is shown in **Table:4.20**

Table 4.20 represents knowledge om consumption of protective foods. It was reported that 28% of participants in the pre-experimental group indicated they consumed one fruit per day. In contrast, the post-experimental group showed a significant difference, with 100% reporting the consumption of two fruits per day. The pre-control group had 24% reporting the consumption of two fruits daily, while the post-control group had 30% reporting the same, indicating no significant changes in the control group**. (Figure 4.8)**

Regarding the quantity of vegetables consumed per day, 12.9% reported consuming 400 grams, 11.9% reported 500 grams, 2% reported c1, 2% reported c2, 8.9% reported c3, and 62.37% reported c4 in the pre-experimental group. In the post-experimental group, 81.1% reported consuming 400 grams, followed by 11.8% for 500 grams, 1.1% for c1, 1.1% for c2, and 2.97% for c4, demonstrating the effectiveness of the intervention. In the pre-control group, 1.3% mentioned 400 grams, while 15% reported c1. In the post-control group, 7.7% reported 400 grams, 1.1% for c1, 4.4% for c2, 10% for c3, and 76.6% for c4.

Concerning the quantity of fats and oils, 2% of the Mahila police recommended consuming 4 teaspoons of oil and 2 teaspoons of ghee. In the pre-experimental group, responses for fats included s1 (2%), s2 (14.9%), s3 (5%), and s4 (76.2%). In the post-experimental group, 100% reported consuming 4 teaspoons of oil and 2 teaspoons of ghee, indicating an improvement in their knowledge. In the post-experimental group, 2% responded with 4 teaspoons of oil and 2 teaspoons of ghee, while 12% reported s2, 4.95% reported s3, and 56.4% reported s4. In the post-control group, not much changes were observed.

For the milk and milk products to be consumed in a day in pre-experimental group reported that 8.9%(500ml), 250 ml (91.1) whereas in pre control group 6.4% responded 500 ml and 84.8% responded 250 ml. However, it was reported post intervention significant improvement was seen in which post experimental responded 500 ml (92.09%) and 250 ml (6.93%) whereas in post control group similar data was reported with no change. **(Figure 4.9)**

For the quantity of sugar consumed per day, 1% answered 4 teaspoons, while 49% reported s2, and s3 (38%), s4 (12%) in the pre-experimental group. In the post-experimental group, 92% reported s2, while the remaining 9% reported s3. In the pre-control group, 1.3% answered 4 teaspoons of sugar, s2 (16.7%), s3 (67.9%). In the post-control group, 2.3% reported 4 teaspoons of sugar and 2 teaspoons of ghee, with s2 (27.3%), s3 (60.9%), and s4 (10.2%).

Breakfast is important because it keeps you active, improves attention and performance at work, and helps prevent fatigue, nausea, and headaches. When asked about the importance of breakfast, 84.2% reported that it keeps them active, and 28.7% noted that it improves attention and performance in the workplace in the pre-experimental group. In the post-experimental group, 100% were aware of the importance of breakfast after the intervention. In the pre-control group, 83.3% answered that it keeps them active, with 11.4% noting its impact on attention in the workplace.

Table 4.20: Knowledge about consumption of protective food groups *p<0.05

		PRE		POST		
		Experimental (n=101)	Control (n=90)	Experimental (n=101)	Control (n=90)	
Sr.no	Particulars	%	%	%	%	P value
1	**Quantity of fruits you should consume in a day**					
	one	63.4	60	0	63	2E-01
	two	28	24	100	30	5E-10*
	don't know					
2	**Quantity of vegetables you should consume in a day**					
	400 gm	12.9	1.3	81.1	7.7	4E-17*
	500 gm	11.9	0	11.8	0	
	Standard cup(c1)	2	15.5	1.1	1.1	1E-03*
	Standard cup(c2)	2	0	1.1	4.4	4E-01*
	Standard cup(c3)	8.9	0		10	2E-03*
	Standard cup(c4)	62.37	0	2.97	76.6	1E-20*
3	**Quantity of milk and milk products you should consume in a day**					
	500ml	8.9	6.4	92.09	8.9	3E-19*
	250 ml	91.1	84.8	6.93	91.1	7E-21*
4	**Quantity of fats/oil you should consume in a day**					
	4 tsp oil and 2 tsp ghee	2	2	100	4.4	5E-25*
	Standard spoon(s1)	2	0	0	0	1E+100
	Standard spoon(S2)	14.9	12.8	0	33	2E-10
	Standard spoon(S3)	5	4.95	0	8.9	8E-03
	Standard spoon(S4)	76.2	56.4	0	52.2	4E-16
5	**Quantity of sugar you should consume in a day**					
	4tsp sugar	1	1.3	0	2.3	5E-25*
	Standard spoon(s1)	0	0	0	0	1E+100

Table 4.20: Knowledge about consumption of protective food groups

Sr.no	Particulars	%	%	%	%	P value
	Standard spoon(S2)	49	16.7	91	27.3	3E-09*
	Standard spoon(s3)	38	67.9	8.9	60.9	3E-11*
	Standard spoon(S4)	12	0	0	10.2	2E-03*
	don't know	1			2.3	5E-01*
6	**Knows importance of breakfast**					
	Keeps you active	84.2	83.3	100	93.3	7E-01*
	improves attention and performance on workplace	28.7	11.4	100	15.6	1E-16*
	you do not suffer fatigue, nausea headache	0	0	99.9	0	3E-30*

***P <0.05**

Figure 4.8 Knowledge on consumption of fruits

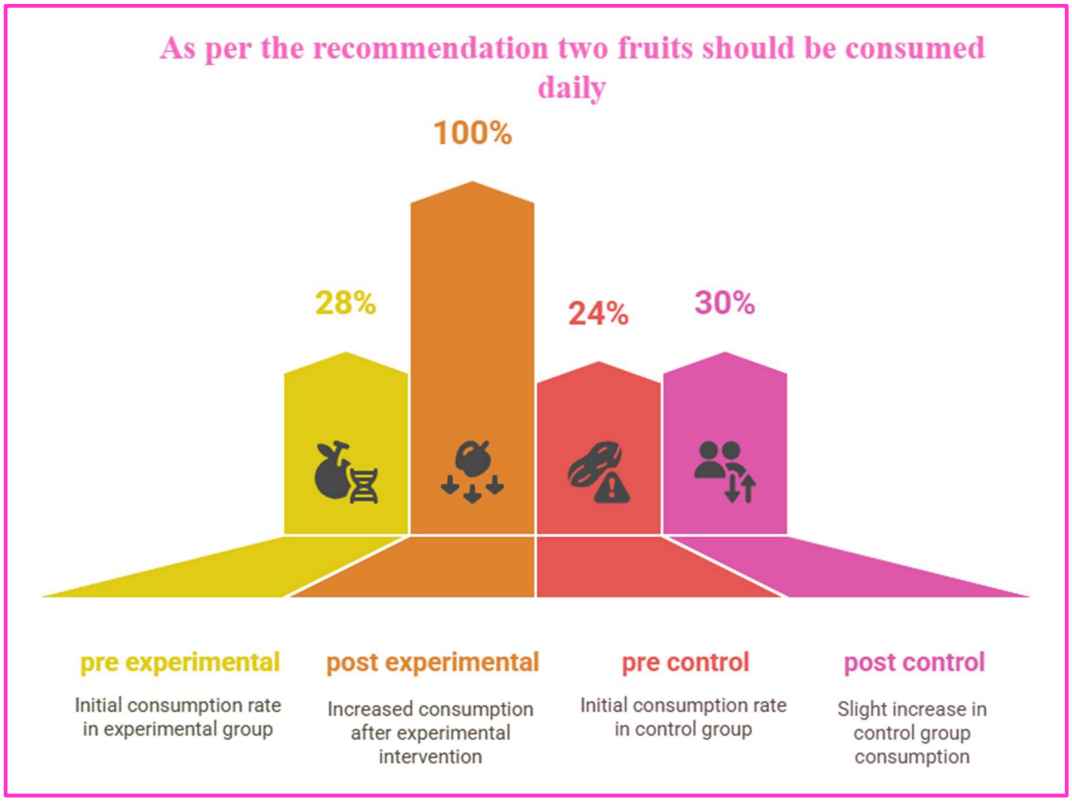
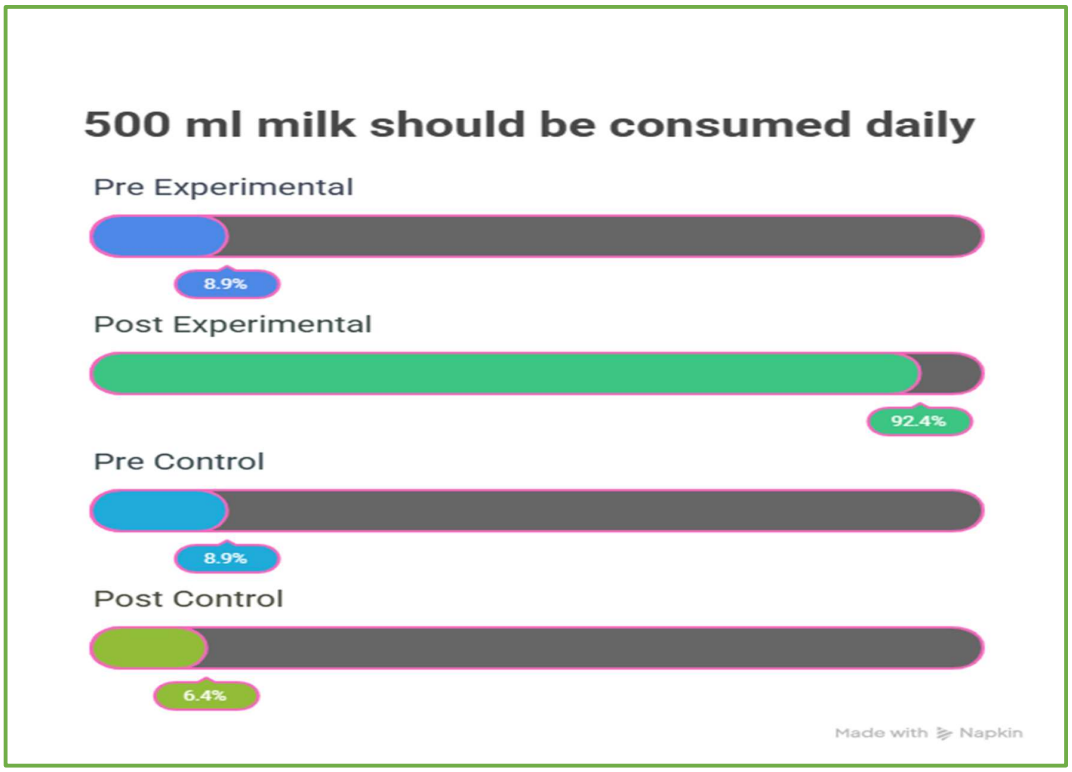


Figure 4.9 Knowledge on consumption of Milk and milk products



Knowledge retention on anemia among Mahila Police

Anemia is still a major public health problem. Sensitization on what anemia is, its causes, consequences, preventive measures, and sources of iron, as well as iron enhancers and inhibitors, was included in counseling sessions. Information was collected pre- and post-intervention on the aforementioned topics regarding anemia. Detailed data is presented in **Table 4.21**. It was found that in both the groups respondents were aware about the term anemia.

What is anemia:

Regarding the description of anemia, 93.8% identified it as low hemoglobin levels in the blood, 78.1% mentioned paleness of the eyes, nails, and tongue, and 45% noted weakness in the pre-experimental group. After intervention, significant improvements were seen, with 100% describing anemia as low hemoglobin levels, paleness of the eyes, nails, and tongue, as well as weakness, respectively. In the pre-control group, 84% responded with low hemoglobin levels, 34.5% mentioned paleness of the eyes, nails, and tongue, while the remaining 84% identified weakness. In comparison to the pre-control group, the post-control data showed no much changes.

Causes of anemia

It was observed that there was poor knowledge about the causes of anemia, which improved significantly post-intervention. In the pre-experimental group, 78.2% cited inadequate consumption of iron-rich foods, 4% noted consumption of iron-rich foods with inhibitors, 70% mentioned excessive blood loss during menstruation, delivery, and hemorrhage, 66% identified blood loss during accidents, and 15% noted frequent episodes of malaria. Post-intervention, knowledge increased to 100%, with 99% responding regarding hookworm infestation, a topic that received no responses in the pre-study. Similarly, in the control group, no significant changes were observed during the pre- and post-intervention phases**. (Figure 4.10)**

Signs and symptoms of anemia

In the pre-experimental group, 90% reported fatigue, 95% mentioned weakness, 79.2% noted pallor of the skin, tongue, and nails, 35.6% reported shortness of breath, 88% indicated dizziness, 5.9% mentioned brittle and spoon-shaped nails, 83.1% reported headaches, and 31.6% noted tingling sensations in the legs. No one reported irregular heartbeat or swelling and soreness of the tongue in the pre-experimental group. After the intervention, 100% gained knowledge about the signs and symptoms of anemia. In the pre- and post-control group, not much differences were observed.

Preventive measures for anemia

More than 90% of the respondent in both the groups mentioned consumption of foods rich in iron as one of the preventive measures. Not much change was observed post sensitization in experimental group. **(Figure 4.11**)

Iron rich sources:

Iron-rich food sources include dark leafy green vegetables, beets, soybeans, jaggery, whole cereals/pulses, eggs, mutton, and fish. In the pre-experimental group, 19.8% mentioned dark leafy greens, 9% cited whole cereals/pulses, 98% identified dates, 23% noted jaggery, and 14.9% mentioned eggs, mutton, or fish. This shows a significant improvement post-intervention, with 100% of respondents in the experimental group gaining knowledge of iron-rich food sources. In the pre- and post-control group, data remained stagnant, reflecting poor knowledge of iron-rich sources, as detailed in **Table:4.21**

Knowledge about inhibitors and enhancers:

Various iron enhancers, such as vitamin C-rich foods, and inhibitors like tea and coffee were also discussed during the intervention. Knowledge regarding the consumption of iron-rich foods and foods that should not be consumed with them was negligible prior to the intervention; however, it significantly improved to 100% post-intervention. In the control group, negligible knowledge was reported in both pre- and post-assessments. This underscores the significance of the counseling sessions**.**

(Figure 4.12)

Table 4.21: Knowledge about causes and preventive measures of anemia

		PRE		POST		
		Experimental (n=101)	Control (n=90)	Experimental (n=101)	Control (n=90)	
Sr.no	Particulars	%	%	%	%	P value
1	**Awareness on term anemia**					
	yes	95	84	100	95	0.7746
	No	5	6	-	5	0.0625
2	**If yes, describe Anemia**					
	low hemoglobin levels in the blood	93.8	100	100	100	
	Paleness of eyes, nails, tongue	78.1	34.5	100	44.7	3.49E-06*
	weakness	46.9	88.1	100	94	0.719712
	NA	5.5	5.5		5.8	0.0625
3	**Causes of Anemia**					
	Inadequate consumption of iron rich foods in the diet	78.2	97.7	100	98.9	0.943368
	Consumption of iron rich foods with inhibitors like tea and coffee	4	4.4	100	16.7	4.96E-16*
	Excessive blood loss as in menstruation, delivery, hemorrhage	70.3	86.6	92.1	87.8	0.765057
	blood loss during accidents	66.3	58.8	94.1	60	0.007628 *
	hookworm	0	0	99	12.2	3.45E-18*
	Frequent Episodes of Malaria	1	5.75	100	24.2	3.19E-12*
4	**Signs and symptoms of Anemia**					
	Fatigue	90	94	100	87.7	0.380251
	Weakness	95	93.3	100	94.4	0.719712
	Pallor of skin, tongue and nails	79.2	41.1	100	47.7	1.47E-05*
	shortness of breath	35.6	77.7	100	80	0.156531
	Dizziness	88	87	100	88.8	0.422479

Table 4.21: Knowledge about causes and preventive measures of anemia

		PRE		POST		
		Experimental (n=101)	Control (n=90)	Experimental (n=101)	Control (n=90)	
	Particulars	**%**	**%**	**%**	**%**	P value
	brittle and spoon shaped nails	5.9	6.6	100	21.1	1.61E-13*
	Headache	83.1	87	100	78.8	0.11523
	Fast irregular heartbeat	0	0	100	4.4	4.72E-25*
	Swelling and soreness of the tongue	0	0	100	2.4	2.07E-27*
	Cold hands and feet	0	0	100	2.4	2.07E-27*
	Tingling sensations in legs	31.6	28	100	37.6	6.99E-08*
	Don't know	4.95	5.5			
5	**Preventive measures of Anemia**					
	Consumption of iron rich foods with enhancers and dietary diversity	94	92.2	100	98.8	0.943368
	consume iron folic acid	41.7	41.5	100	44.7	3.49E-06
	Cleanliness of house inside and outside	1	1.2	2	1.2	1
	Consume albendazole tablets twice a year	0	0	99	0	3.16E-30
	Eat Purna shakti packets	22.9	32.1	100	31.8	1.16E-09
	don't know	4.9	4.9	-	4.9	0.125

***p<0.05**

Table 4.21: Knowledge about causes and preventive measures of anemia

		PRE		POST		
		Experimental (n=101)	**Control (n=90)**	**Experimental (n=101)**	**Control (n=90)**	
	Particulars	**%**	**%**	**%**	**%**	P value
6	**sources of iron rich foods**					
	Green leafy vegetables	19.8	20.2	100	20	5.51E-14*
	Whole cereals and pulses	8.9	2.2	5.9	2.2	0.7265
	Dates	98	97.8	100	97.8	0.8867
	soyabean	0	0	100	0	1.58E-30
	Jaggery	29	31.5	100	32.2	2.43E-09
	Egg/Meat/fish	14.9	38.2	100	38.9	1.29E-07
7	**Foods to be consumed with iron rich foods**					
	vitamin C rich Foods-Amla/lemon/Orange/guava	-	-	100	1	8.05E-29*
	Don't know	100	100	-	99	3.16E-30
8	**Foods not to be consumed with iron rich foods**					
	Tea or coffee	0	0	100	3.3	3.59E-26*
	Don't know	100	100	-	96.6	2.52E-29

***p<0.05**

Figure 4.10 Knowledge on causes of anemia

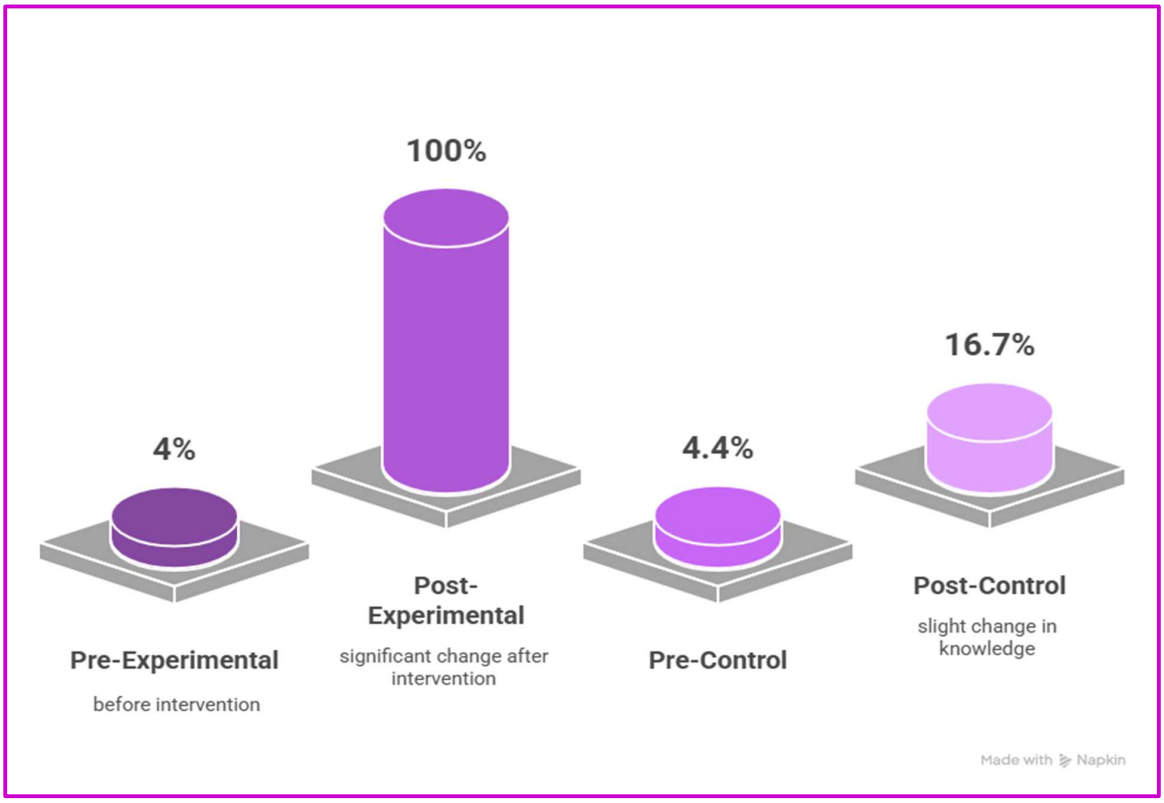


Figure 4.11 Knowledge on prevention of anemia

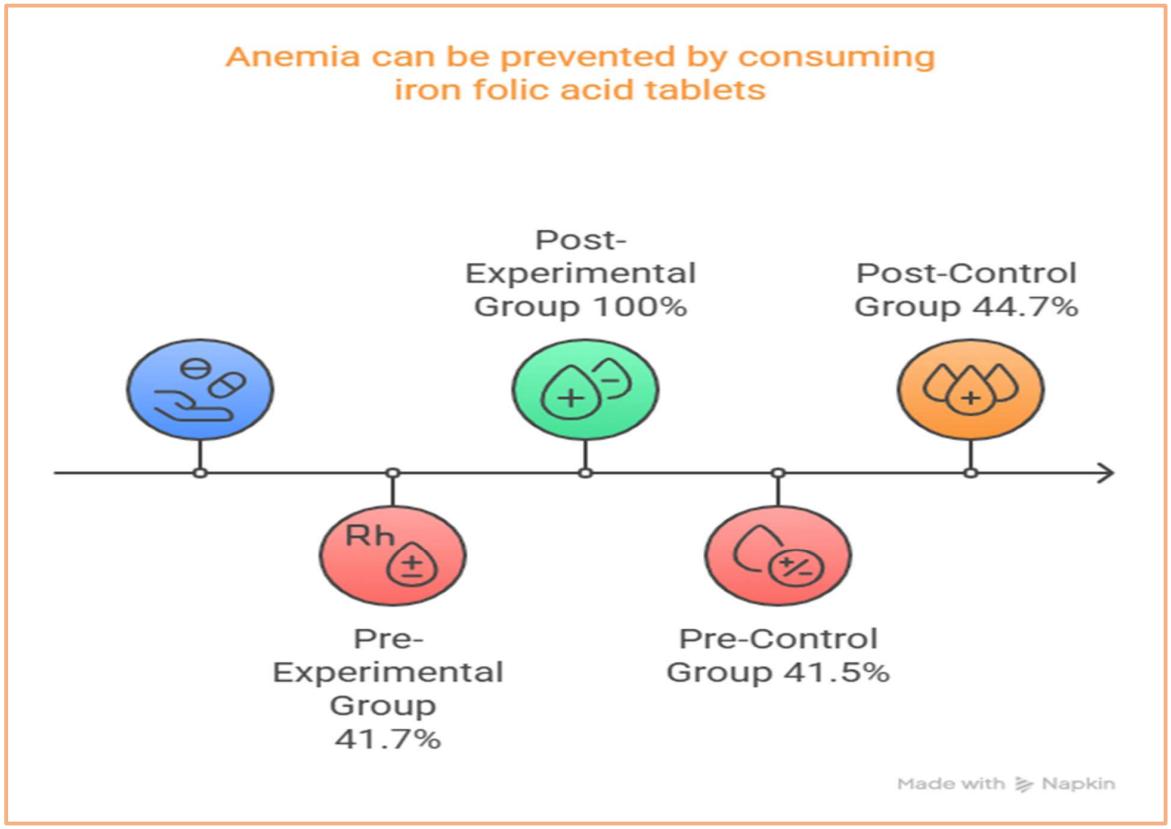
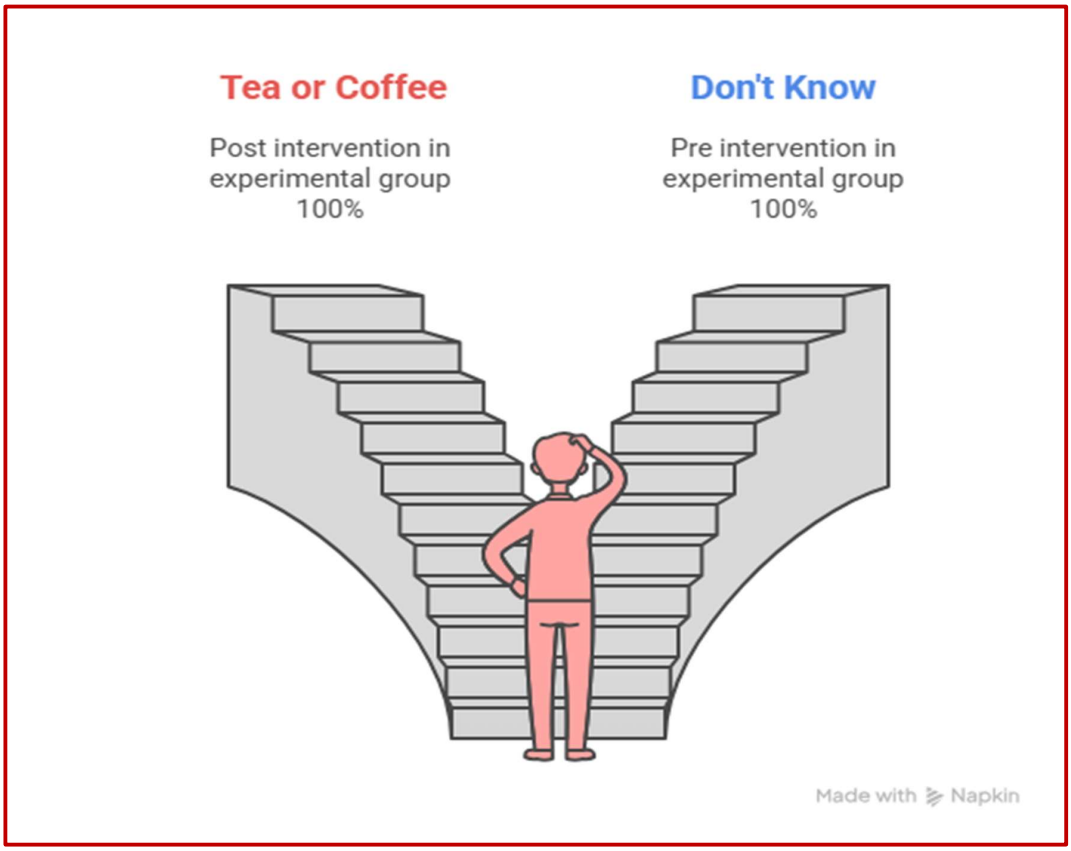


Figure 4.12 Knowledge on foods not to be consumed with iron rich foods



Knowledge retention of NCDs Among Mahila Police

Knowledge about the term "NCD," common NCDs, risk factors, and preventive measures was assessed before and after the intervention. Detailed data is presented in **Table 4.22.** All the members in both the groups were reported to know about term NCD at baseline only.

NCDs:

Knowledge about these common NCDs was assessed among Mahila police. In the pre-experimental group, 76.8% identified diabetes, 64.2% hypertension, 43% cancer, 6.2% heart disease, and 6.5% obesity. In the post-experimental group, knowledge increased to 100%, demonstrating the significance of counseling on these subjects. In the pre-control group, 97.7% identified diabetes, 12.6% obesity, 92% hypertension, 24.1% cancer, and 25.9% chronic lung diseases, with similar figures observed in the post-control group, showing no change.

Knowledge of risk factors in the pre-experimental group was poor, but it significantly increased to 100% after the intervention in the post-experimental group. In contrast, the control group showed not much change in pre- and post-data**. (Figure 4.13)**

Prevention of NCDs

Few respondents could identify preventive measures for NCDs, with a large number lacking adequate knowledge in both the experimental and control groups. However, after the intervention, 100% of respondents in the post-experimental group provided correct answers, while the control group showed little difference in pre- and post-data.

Information on common risk factors for NCds seen as unhealthy eating habits high in sugar, salt, and fat, and addictions to tobacco, drugs, and alcohol was found to be satisfying in both the groups. However low consumption of fruits and vegetables was identified as one of the risk factors in post experimental group which was not reported by control group.

Risk factors for diabetes were also queried, revealing a lack of knowledge among Mahila police. According to the data, 14.9% identified obesity, 93.1% genetics, 39.6% physical inactivity, and 4% excessive consumption of HFSS foods in the pre-experimental group. In the control group, 98.9% identified genetics, 36% physical inactivity, and 4% excessive consumption of HFSS foods. However, post-intervention knowledge in the post-experimental group reached 100%, with respondents also adding ethnicity as a risk factor, while the post-control group showed slight change.

Risk factors for hypertension were identified alongside diabetes risk factors. According to the reported data, 48.5% cited obesity, 24.8% mentioned lack of exercise, 5% referred to an unhealthy diet, and 86.1% indicated excessive consumption of HFSS in the pre-experimental group before the intervention. After the intervention, the percentage of correct responses regarding risk factors increased to 100% among the mahila police in the post-experimental group, demonstrating the significance of the counseling sessions provided. Poor knowledge was observed in the pre-post control group, with minimal changes noted in both groups.

Table 4.22: Knowledge on NCDS among Mahila Police *p<0.05

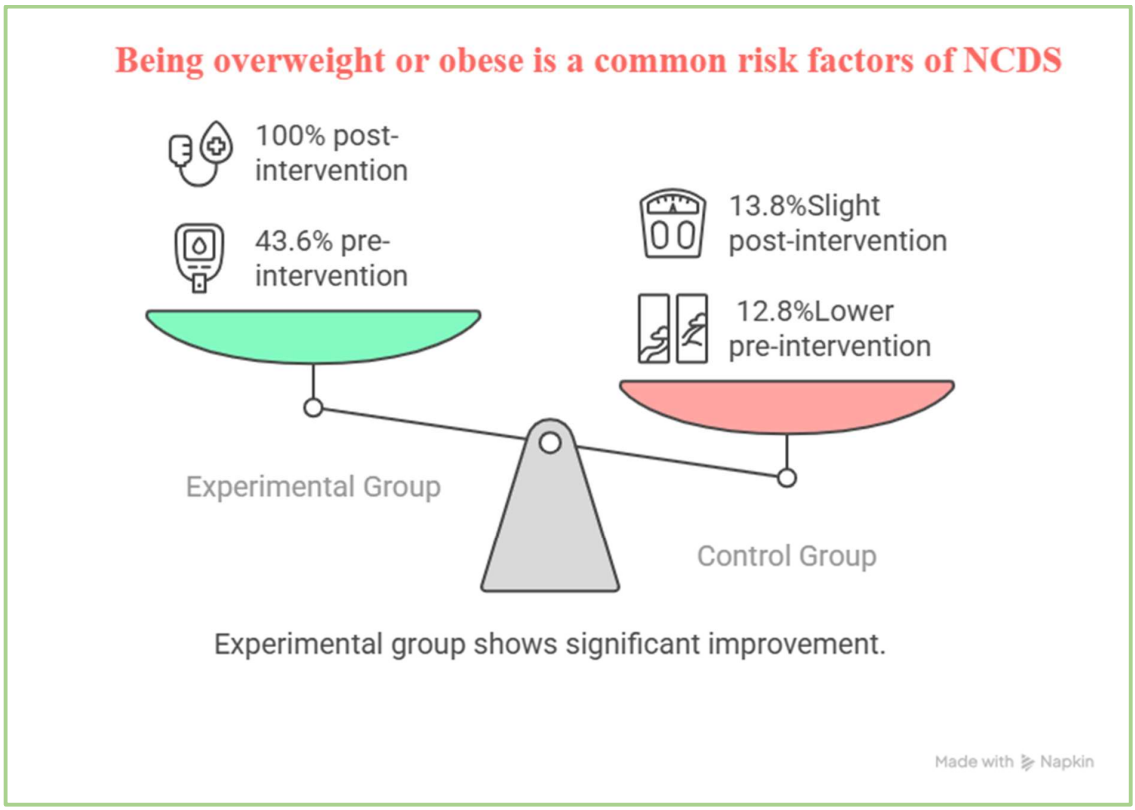
		PRE		POST		
		Experimental (n=101)	**Control (n=90)**	**Experimental (n=101)**	**Control (n=90)**	
Sr.no	**Particulars**	**%**	**%**	**%**	**%**	P value
1	**Awareness on NCD**					
	Yes	94.1	97.7	99	96.6	0.88616
	No	5.9	2.2	1	3.3	0.625
2	**If yes, describe common NCDs**					
	Diabetes	76.8	97.7	100	96.6	0.8303
	Obesity	9.5	12.6	100	11.4	4.09E-19*
	Hypertension	64.2	92	100	92	0.6135
	Heart Disease	6.3	24.1	100	23.9	1.22E-12*
	Cancer	42.1	25.9	100	23.9	1.22E-12*
	Chronic Lung Disease			100	1.1	8.05E-29*
	NA	5.94	2.2	-	2.2	0.5
3	**Comon risk factors of NCDS**					
	Unhealthy eating habits diet high in sugar and salt	76.8	96.6	100	96.6	0.830393
	Diet low in Fruits and vegetables			100	0	1.58E-30*
	Physical inactivity	18.9	78.2	100	77.3	0.0979
	being Overweight/obese	43.6	12.8	100	13.8	8.47E-18*
	Addiction like tobacco, drug and alcohol	11.6	26.8	100	36.4	3.72E-08*
	stress	21.3	30.2	100	32.2	2.43E-09*
	Low consumption Of fruits and vegetables			100	2.3	2.07E-27*
	High consumption of HFSS	42.1	13.8	100	13.6	8.47E-18*
	Don’t know	5.9	2.2	-	2.2	0.5
4	**Prevention of NCDS**					
	Maintaining a healthy body weight	47	20.5	100	21.3	1.61E-13*
	Be physically active regularly	91	96.6	100	96.6	0.8303
	Maintain a healthy balance in your diet	43	85.2	100	85.4	0.303327

Table 4.22: Knowledge on NCDS among Mahila police

		PRE		POST		
		Experimental (n=101)	**Control (n=90)**	**Experimental (n=101)**	**Control (n=90)**	
Sr.no	**Particulars**	**%**	**%**	**%**	**%**	P value
	Do not include too much fat/sugar/salt in your diet	5	2.3	100	6.7	4.47E-23*
	Eat foods that are high in fiber (salads, fruits, whole grains, cereals, whole pulses and its products)	-	-	100	3.4	3.59E-26*
	Avoid tobacco use, drug and alcohol abuse	27	47.7	100	47.2	1.47E-05*
	Avoid consuming aerated drinks	-	-	100	1.1	8.05E-29*
	Read the food label on packaged food items like information about the nutritional value of a food and shelf life of the product	-	-	100	0	1.58E-30*
	Manage stress	28	20.5	98	20.2	1.53E-13*
	Don't know			0	1	1
5	**Risk factors for Diabetes**					
	Obesity	14.9	3.4	100	3.3	3.59E-26*
	genetics	93.1	98.9	100	97.8	0.8867
	Physical inactivity	39.6	36	100	35.6	1.94E-08*
	Excessive consumption of HFSS Food	4	4.5	100	6.7	4.47E-23*
	Ethnicity			100	0	1.58E-30*
6	**Risk factors for Hypertension**					
	Obesity	48.5	52.8	100	53.3	0.00018
	Lack of exercise	24.8	12.4	100	12.2	1.93E-18*
	Unhealthy diet	5	7.9	100	7.8	3.45E-22*
	Excessive consumption of HFSS Food	86.1	94.4	100	94.4	0.719712

***p<0.05**

Figure 4.13 Knowledge on common risk factors of NCDS



Knowledge retention on dietary diversity among Mahila Police

Dietary diversity is very important to achieve daily nutrition for women. Information was asked about whether they are familiar with the term dietary diversity. Information is presented **in Table 4.23.** It was found that almost all more than 95% in both the groups reported dietary diversity as consuming a variety of foods and food groups.

Table 4.23: Knowledge on dietary diversity among mahila police

		PRE		**POST**		
		Experimental (n=101)	**Control (n=90)**	**Experimental (n=101)**	**Control (n=90)**	
Sr.no	**Particulars**	**%**	**%**	**%**	**%**	P value
1	**Describe diet diversity**					
	consuming variety of foods and food groups	**98**	**96.7**	**100**	**96.7**	**0.83039**
	Focusing only on protein rich foods	**11.9**	**3.3**	**-**	**3.3**	**0.25**
2	**How to achieve diet diversity in daily life?**					
	variety food	**99**	**96.7**	**100**	**96.7**	**0.83039**
	eat green leafy veg	**1**	**2.2**	**1**	**2.2**	**1**
	try new recipe and foods	**16.8**	**5.6**	**0**	**5.6**	**0.0625**

***p<0.05**

Change in Dietary Practices Among Mahila Police

Table 4.24 presents information on the dietary practices of mahila police, detailing dietary diversity and specific eating habits. Changes in dietary practices were assessed by inquiring about the regular consumption of fruits, water consumption, the frequency of eating junk food, the number of meals per day, and whether they consumed tea or coffee with breakfast.

Daily water consumption among mahila police was also assessed. In the pre-experimental group, 35.6% reported drinking 700-1 liter of water daily, 46.5% consumed more than 1 to 1.5 liters, 7.9% drank over 1.5 liters, and 5.9% consumed more than 2 liters. Post-counseling data indicated an increase in water consumption, with 44.6% now consuming over 1.5 liters, 38.6% drinking more than 1 to 1.5 liters, 15.8% consuming 700-1 liter, and 3.3% exceeding 2 liters However in the pre-control group, 41.8% drank 700-1 liter, 29.1% more than 1 to 1.5 liters, 24.1% over 1.5 liters, and 1.3% more than 2 liters daily this shows significant change. Whereas in post-control data showed little change: 35.6% consumed 700-1 liter,

33.6% more than 1 to 1.5 liters, 26.7% drank over 1.5 liters, and 1.1% exceeded 2 liters. Thus, the experimental group demonstrated a significant increase in water consumption post-counseling compared to the control group.

The findings underscore the impact of counseling on dietary practices among the mahila police in Vadodara city, highlighting improvements in dietary diversity and water consumption following intervention.

The Mahila police primarily consumed three meals a day. Breakfast, lunch, and dinner were reported by all respondents in both the experimental and control groups, with a 100% response rate. Additionally, 94.1% of the experimental group began having brunch, followed by 69.3% consuming evening snacks and 10.9% having supper post-intervention. In contrast, the post-control group reported no brunch or evening snacks, with only 1% consuming supper. No difference was observed in post control group.

Daily fruit consumption among Mahila police officers showed that 97% consumed fruit daily in the experimental group post-intervention which is significant, whereas only 2% in the control group reported daily fruit consumption, leaving 98% not including fruit in their daily diet.

Regarding the consumption of tea or coffee with breakfast, post-intervention results indicated that 90% of the experimental group did not consume these beverages with breakfast, while only 10% did. In the control group, however, 99% consumed tea or coffee daily with breakfast.

The frequency of junk food consumption revealed that post-intervention, 87.1% of the experimental group consumed junk food only once a week only, and 12.9% ate it twice a week, indicating a reduction in the intake of processed, junk, and outside food. In the control group, 90% consumed junk food three times a week, while 10% did so twice a week. This shows significant changes in dietary practices post intervention by comparing pre data with post data.

Information on the consumption and purchase of various junk foods and packaged foods, such as processed foods, fried foods, sweets and carbonated drinks was collected at baseline and after the intervention. It was noteworthy that the frequency of purchase and the amount of money spent on such junk foods decreased in the experimental groups post-intervention. Before counseling, the money spent on junk food ranged from 100 to 200 rupees, which dropped to less than 100 rupees (a reduction of 82.17%), with only 10% spending more than 100 rupees afterward. This change was found to be significant (Table 4.22). Detailed information is shown in Table 4.23

Table 4.24: Dietary Practices Among Mahila Police *p<0.05

		PRE		POST		
		Experimental (n=101)	Control (n=90)	Experimental (n=101)	Control (n=90)	
Sr.no	Particulars	%	%	%	%	P value
1	**Water Consumption**					
	700-1 lt	35.6	41.8	15.8	35.6	0.00460
	>1-1.5 lt	46.5	29.1	38.6	33.3	0.63530
	>1.5 lt	7.9	24.1	44.6	26.7	0.05681
	>2 ltrs	5.9	1.3	3	1.1	0.625
2	**Do you consume junk food?**					
	yes	92.1	88.9	92	88.9	0.82314
	NO.	7.9	11.1	7.9	11.1	0.35928
	Total					
3	**If yes, describe your preference**					
	Packed snacks	97.9	97.5	97.9	97.5	1
	Fried snacks	90	95.1	1.1	92.6	1.90E-26*
	Sweets	55.4	90	30.1	88.8	8.55E-08*
	NA	7.9	10	6.9	10	0.454498
4	**If yes, money spent in Aday to buy junk food**					
	<100 rs	14.8	10	82.17	10	3.30E-15*
	100-200	77.2	77.7	10	88.8	9.94E-17*
	NA	7.9	11.1	7.9	11.1	0.35928
5	**meals in a day**					
	Breakfast	100	100	100	100	1
	brunch	1.98	0	94.1	0	1.01E-28*
	lunch	100	100	100	100	1
	evening snack	5.94	0	69.3	0	3.39E-21*
	Dinner	100	100	100	100	1
	supper	1.98	0	10.9	1.1	0.03857

Table 4.24: Dietary Practices Among Mahila Police

		PRE	POST			
		Experimental (n=101)	Control (n=90)	Experimental (n=101)	Control (n=90)	
Sr.no	Particulars	%	%	%	%	P value
6	**Do you consume fruits daily?**					
	yes	11.8	2.2	97	2.2	1.56E-26*
	no	88.11	97.8	2.9	97.8	
	Total	100	100	100	100	1
7	**Do you consume tea /coffee with breakfast?**					
	yes	86.13	98.8	10	99	1.46E-19*
	no	13.8	1.1	90	1	7.43E-26
	Total					
8	**Frequency junk food**					
	once			87.1	0	1.29E-26*
	twice	42.5	31.1	12.9	10	0.831811
	thrice	49.5	57.7	0	90	1.62E-27
	NA	7.9	11.2			
	Total	100	100	100	100	

***p<0.05**

Minimum Dietary Diversity of Women (MDD-W) of Mahila Police

MDD-W was calculated using FANTA-USAID 2016 guidelines.

Using the 24-hour dietary recall method, information on the food groups consumed the previous day was collected. **Table 4.25** presents in the pre-experimental group, 39.6% of the Mahila police had an MDD-W, meaning they consumed a minimum of 5 out of 10 food groups. After the intervention, which improved to 85%, which was significant. In the pre-control group, 45.5% had an MDD-W, and this percentage remained unchanged in the post-control data**. (Figure 4.14)**

Food groups consumed by Mahila Police

Information on the consumption of food groups is depicted in **Table 4.26**. One day 24-hour dietary recall was used to collect data on consumption of food groups. It was revealed that the intake of protective foods such as dark green leafy vegetables and vitamin A-rich fruits and vegetables was much lower in the pre-experimental group. However, this improved in the post-counseling phase for the experimental groups of Mahila police which is significant. (Table 4.24). Not much difference was observed in control group

Table 4.25: Minimum Dietary Diversity of Women (MDD-W) of Mahila Police

		PRE		POST		
		Experimental (n=101)	Control (n=90)	Experimental (n=101)	Control (n=90)	
Sr.no	Particulars	%	%	%	%	P value
1	Food Groups Consumed					
	>=5	39.6	45.5	85.5	45.5	0.000832*
	<5	60.4	54.5	14.5	54.5	6.92E-07
	Total	100	100	100	100	

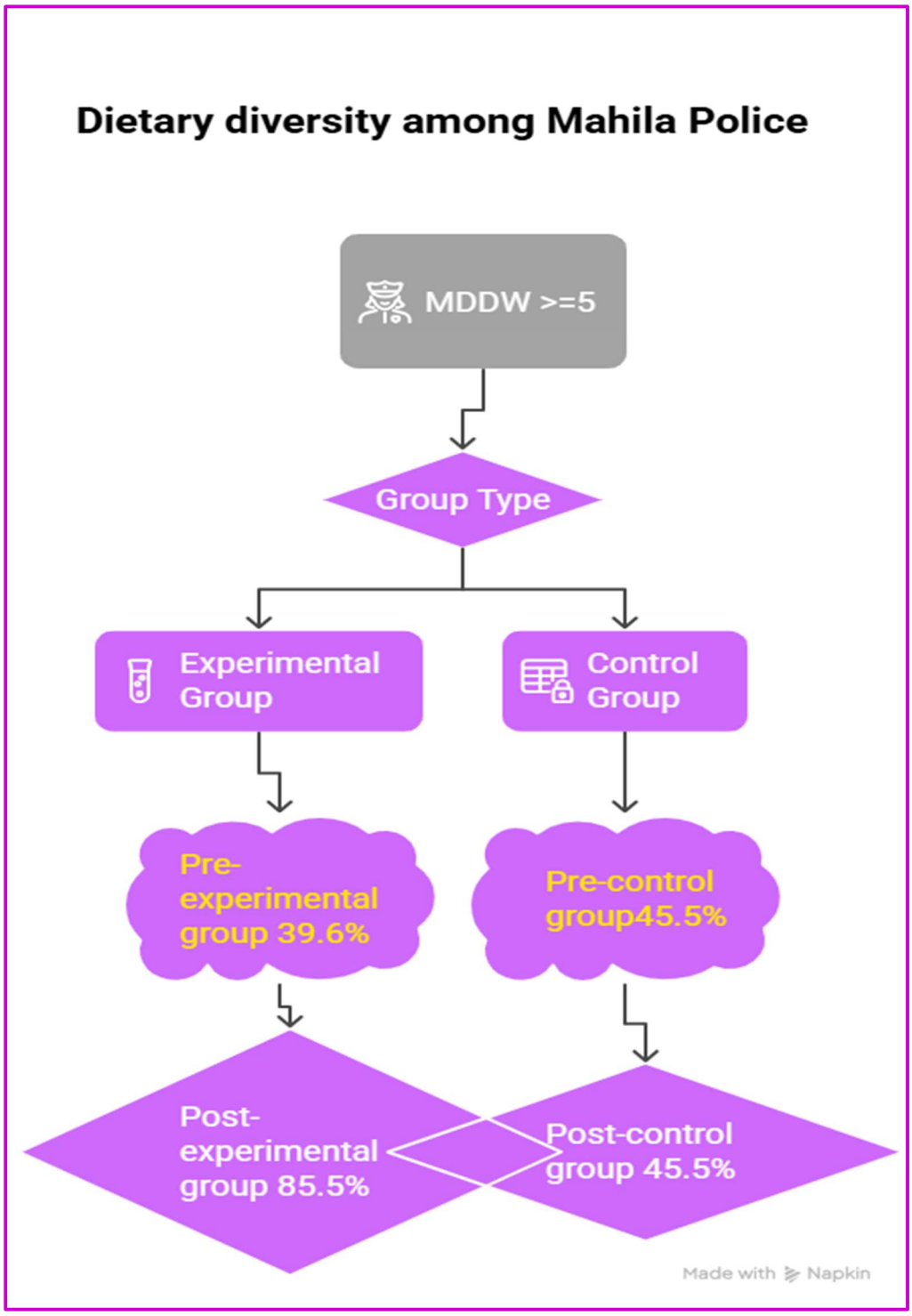
*p<0.05

Table: 4.26 Food Groups consumed by Mahila police

		PRE		POST		
		Experimental (n=101)	Control (n=90)	Experimental (n=101)	Control (n=90)	
Sr.no	Particulars	%	%	%	%	P value
1	Food groups consumed by Mahila Police					
	Grains, white root tubers and plantains	100	100	100	100	1
	eggs	9.9	7.8	9.9	7.8	1
	dairy	93.1	96.7	93.1	96.7	0.88438
	Dark leafy vegetables	25.7	15.6	44.6	16.7	0.000729*
	Pulses and legumes	100	100	100	100	1
	Other vitamin A rich fruits and vegetables	3	3.3	19.8	4.4	0.00661*
	Other fruits	16.8	25.6	98	25.6	2.08E-11*
	Meat poultry and fish	15.8	11.1	15.8	11.1	0.55719
	Other vegetables	98	96.7	98	96.7	0.942789
	Nuts and seeds	5.9	22.2	77.2	23.3	5.51E-08*

*p<0.05

Figure 4.14 Minimum Dietary Diversity of Women (MDD-W) of Mahila Police



Change in Physical Activity Patterns Among Mahila Police:

The importance of physical activity, along with the advantages and disadvantages of social media, was included in the nutrition and health module. **Table 4.27** presents the physical activity patterns of the Mahila Police. When asked about their fitness regime, 24.7% of the Mahila Police in the pre-experimental group reported attending gym or yoga classes daily, while 36% in the pre-control group had a fitness regime. However, following the counseling session, data revealed an increase to 46.7% in the experimental group, while the post-control group remained unchanged.

It was found that 1.9% exercised 3-5 days a week, followed by 13.8% who exercised more than 5 days in the experimental group. Post-counseling, 43% began exercising more than 5 days a week, with 42% exercising 3-5 days a week. This increase in the percentage of physical activity indicates the effectiveness of counseling. In both control groups, minimal differences were reported between pre- and post-intervention data. Notably, 30% of the Mahila Police started exercising after the intervention **(Figure 4.15).** To assess other physical activities aside from their fitness regime, household activities performed by the Mahila Police were also gathered

The wake-up times of the respondents were also assessed. In the pre-experimental group, 59% of respondents woke up between 4-7 a.m., and 40.5% woke up between 8-10 a.m. Similar data was reported in the post-experimental group. However, in the pre-control group, 52.2% woke up between 4-7 a.m., 45.6% between 8-10 a.m., and 2% between 11 a.m.-12 p.m. In the post-control group, a significant change was observed. Here in post control group significant change was observed because change in shift works only 8% woke up between 4-7 a.m., a substantial reduction, while 92% woke up between 8-10 a.m.

Sleeping hours were also assessed by evaluating sleep duration and wake-up times. In the pre-experimental group, 45.5% reported sleeping less than 8 hours, while 54.4% slept more than 8 hours. Similar data was reported in the post-experimental group. In the pre-control group, 24.4% slept less than 8 hours, and 75.5% slept more than 8 hours. In the post-control group, small changes were noted, with 47.7% <8hrs of sleep and 52.2% sleep >sleeping less than 8 hours and 52.2% sleeping more than 8 hours.

Screen time on social media was also assessed. In the pre-experimental group, 64.3% spent 1-2 hours daily on social media, while 36% spent more than2 hours. After counseling, this dropped to

6.93% spending more than 2 hours, with 93% spending 1-2 hours. This demonstrates the significance of counseling among the Mahila Police. In the pre-control group, 65.4% spent more than 2 hours, which reduced to 31.3% in the post-control group, while 34.5% who spent 1-2 hours increased to 68.8% in the post-control group. Thus, significant changes were observed in both the experimental and control groups. Significant improvement was seen in screen time from >2 hours to 1-2 hours**. (Figure 4.16)**

Table 4.27: Physical activity among Mahila Police

		PRE	POST			
		Experimental (n=101)	Control (n=90)	Experimental (n=101)	Control (n=90)	
Sr.no	Particulars	%	%	%	%	P value
	Physical activity					
1	Any fitness regime, Gym/yoga/fitness club					
	Yes	24.7	36.7	41.6	36.7	0.415985
	No	75.2	63.3	58.4	63.3	1
2	**Do you go walking or jogging after office hours**					
	Yes	27.7	30	44.6	30	0.056815
	No	72.3	70	55.4	70	0.51949
3	**police officer exercise**					
	Parade	100	100	100	100	0.5139
4	**How many days you exercise in a week**					
	3-5 days	1.9	6.7	2	20	0.000402
	>5 days	13.8	11.2	42.5	22.2	0.007149*
	NA	84.1	82.2	55.4	57.7	0.8468
5	**Time spent on sitting/reclining**					
	<8 hrs.	1	98.8	1	30	2.16E-07
	>8hrs	99	1.11	99	70	0.005793
6	**Wake up time**					
	4-7 am	59.4	52.2	59.4	8.8	1.02E-10
	8-10 am	40.5	45.6	40.5	91	0.00018
	11am-12pm		2.2			
7	**Sleeping time**					
	<8hrs	45.5	24.44	45.5	47.7	0.91518
	>8 hrs.	54.4	75.5	54.45	52.2	0.550709
8	**Time spent on social media**					
	1-2hr	64.3	34.5	93	68.8	0.015694*
	>2 hrs.	35.6	65.5	6.93	31.1	0.000195

***p<0.05**

Figure 4.15 Exercise more than 5 days per week

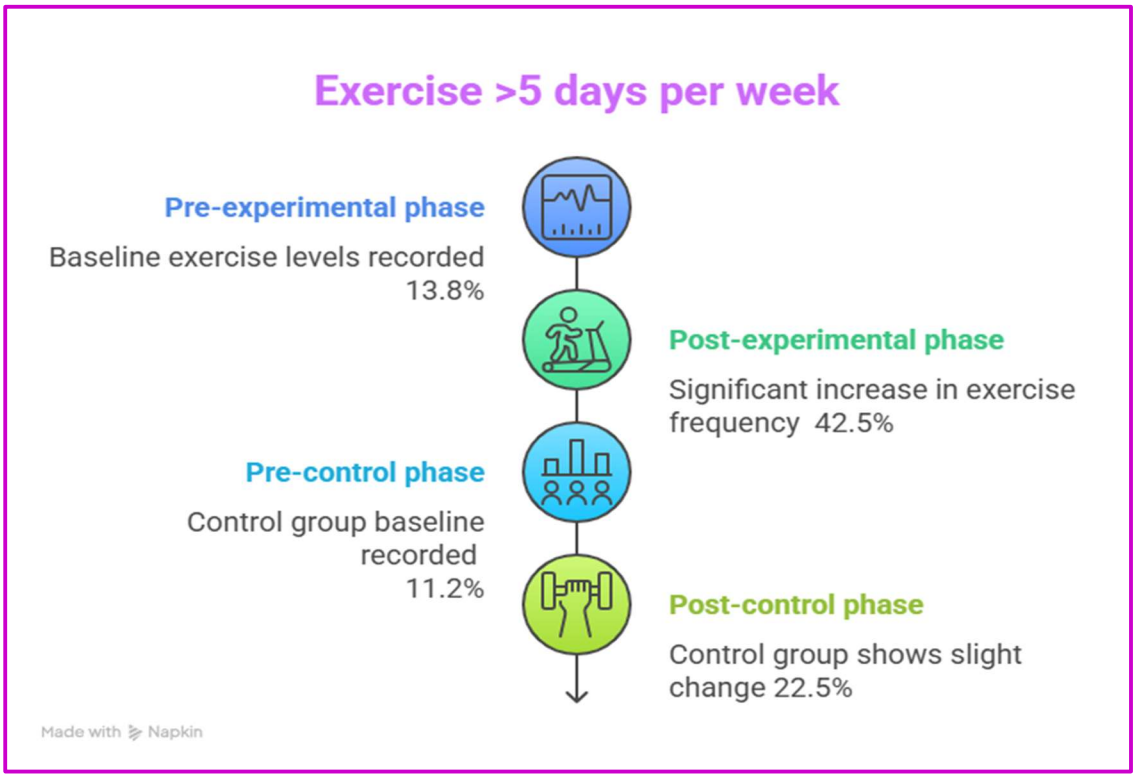
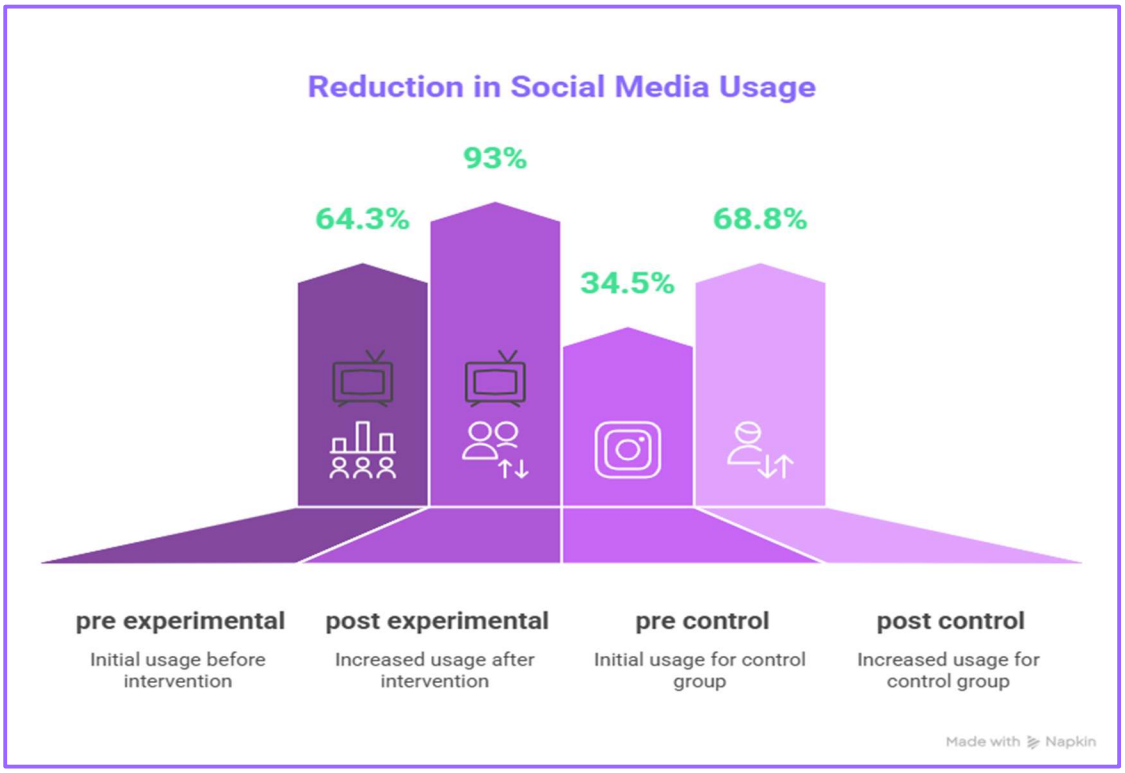


Figure 4.16 Time spent on social media



At the baseline information on following aspects of dietary practice and physical activity were elicited. It was envisaged that, post intervention there will be positive improvement on those aspects. **Table 4.28** is depicting change with significance level.

- Regular Breakfast consumption
- Fruits intake
- Diet diversity
- Reduction in consumption of processed foods
- Increase in water consumption
- Decrease in tea and coffee consumption with breakfast or lunch
- Daily Physical activity/30mins or any other activity
- Minimum 8 hrs. of sleep

Table 4.28: Change with significance level in dietary practices among Mahila Police

		Experimental		Control		P value
Sr.no.	**Particulars**	**N=101**	**%**	**N=90**	**%**	
1	**Daily Fruit consumption**	**99**	**98**	**23**	**25.6**	1.56E-26*
2	**Diet diversity (MDD-W)**	**86**	**85.5**	**41**	**45.5**	0.000832*
3	**Frequency of eating junk food**					
	Once a week	88	87.1	0	0	1.29E-26*
4	**Do you consume tea /coffee with breakfast?**					
	Yes	10	10	89	99	1.46E-19*

It can be seen from the table 4.28 that 8 week of counselling session to mahila police has helped in improving selected practices like consumption of daily fruits intake, reduction in consumption

of processed foods, diet diversity and decrease in tea and coffee consumption with breakfast or lunch. Hence, the improvement was seen to be significant.

Enabling environment:

- Permission to carry out study from higher authorities of urban Vadodara police facilitated the enrollment of mahila police from various police stations.
- Head of individuals of police stations enrolled and respondents were cooperative for the study irrespective of their odd duty hours.

Barriers:

- Availability of all the Mahila police at one time was not seen as they had to attend emergency.
- Hybrid mode of counselling was adopted due to different working hours of mahila police

Highlights of the findings – Section III

Daily fruit consumption among Mahila police officers showed that 97% consumed fruit daily in the experimental group post-intervention which was significant

In the pre-experimental group, 39.6% of the Mahila police had an MDD-W, meaning they consumed a minimum of 5 out of 10 food groups. After the intervention, which improved to 85%, which was significant.

Post-intervention results indicated that 90% of the experimental group did not consume beverages such as tea/coffee with breakfast which was significant.

Significant Reduction in consumption of processed was also reported post intervention.

Increase in water consumption was reported, with 44.6% consuming over 1.5 liters, 38.6% drinking more than 1 to 1.5 liters, 15.8% consuming 700-1 liter, and 3.3% exceeding 2 liters

46.7% in the experimental group who did 30 mins of physical activity such as gym/yoga class regularly.

Significant improvement was seen in screen time from >2 hours to 1-2 hours.

DISCUSSIONS

The key highlights of the results are discussed below. It includes knowledge and practice of Mahila police on selected aspects of nutrition and dietary practices

Total of 190 mahila police were enrolled for the study, out of which Approximately 86.3% of the Mahila Police belonged to reserved categories such as SC/ST/OBC, with 37% reported as OBC, ST with 30.4%, SC with 18.8and only 13.6% belonged to the general caste.

The mean age of the Mahila Police is 32 ± 7.56 years. Around 61% completed their graduation followed by 30% with post-graduation degrees (29.8%), and 9.4% have studied up to higher secondary level.

A total of 111 Mahila Police were married (58.1%), 77 are unmarried (40%), and 3 (1.5%) are divorced and living separately.

Rai and Archana (2022-23) conducted an interventional study of Nutritional status, mental health and job satisfaction of women working in Police Varanasi district on women police in Varanasi district. The findings of the study revealed that SC (40.35%) has highest representation followed by OBC (30.8%) and general (25.06%) while ST (4.51%) has the least representation in female police force of Varanasi District. Regarding their Qualification, majority of the respondents have completed their Undergraduate (66%), 27% respondents completed their post-graduation. Average age of the respondents was found to be 26.34 years with standard deviation of ± 4.84. their marital status data showed (81.95%) are unmarried, while 67 (16.75%) and 5 (1.25%) were married and widow respectively.

In the present study, the nutritional status of mahila police was assessed using Asia pacific BMI classification (2007).it was found that most of the police officers fall into the normal weight category (41.3%), while 29.8% are overweight, 15.1% are obese, and the remaining 13.6% suffer chronic energy deficiency. The mean waist circumference (WC) of the respondents was 31.8 cm and the mean waist-to-hip ratio (WHR) was 0.814.

Muragod P. et.al (2018) conducted a study on Nutritional Status of Women Police of Hubballi-Dharwad, Karnataka. It stated that 3.33 %of police women were underweight and 31.11 per cent were normal remaining 66 per cent were obese as per Asia pacific BMI classification. Further

(66.67%) exhibited substantially increased risk of metabolic complications with WHR of more than or equal to 0.85. A strong positive association was recorded at 0.05 per cent level of significance for age and BMI of women police.

Nagendra A (2019) conducted a study on Dietary Habits and Nutritional Screening of Bangalore City Police that say Mean BMI was found to be 26 kg/m2 ± 2.9 where majority of them (50%) were falling in the category of overweight and 8% had BMI >30 kg/m2 indicating obesity 60% of the total subjects were obese.

In the present study prevalence of chronic morbidity was also assessed which shows 17% were hypertensive and 1 % of them were suffering from Diabetes.

Kishan Kumar et.al (2017) examined Prevalence of Chronic Morbidity and Sociodemographic Profile of Police Personnel: A Study from Gujarat. The prevalence of chronic morbidity, hypertension and diabetes were 9.5%, 5% and 2.6% respectively.

A similar study by Nagendra A (2019) conducted a study on Dietary Habits and Nutritional Screening of Bangalore City Police. It was found that co morbidities such as diabetes (13%) with 85% had clinical symptoms.

Padmanabhan A et.al (2024) carried out a study on Cardiovascular risk factors and metabolic syndrome among police officers in Kozhikode corporation of Kerala. The study revealed Metabolic syndrome was observed in 45.1% of the study population. Obesity and lack of physical activity were the commonest abnormalities. Cardiovascular risk factors identified were high BMI (67.3%), lack of physical activity (47.1%), hypertension (16.7%), alcohol use (24.2%), smoking (17.3%) and diabetes (8.8%). Conclusions: There is a rising prevalence (16.8% in 2012 to 45.1% in 2021) of Metabolic Syndrome among policemen in Calicut Corporation

Dietary diversity and dietary practices

Regarding the dietary practices among mahila police, it was found that 82.1% of participants were vegetarian, while 17.9% were non-vegetarian. It was observed from the data that all the members ate staple food i.e. wheat. Hundred percent of Mahila Police reported for pulse consumption. Protective rich foods like Vitamin A rich fruits and dark leafy vegetables consumed by only 3.1% and 21% of the respondents. Dairy products were consumed by 94.1% followed by fruits (20.9%)

and vegetables (97.9%).it was observed that very few of them were having nuts and oilseed (13.6%) in their diet.

90.6% of respondents consumed junk food, with preferences including packed foods (89.5%), fried snacks (87.9%), carbonated drinks (54.9%), and sweets (67%).

Notably, 100% of respondents reported eating three main meals per day, which included breakfast, lunch, and dinner

Minimum Dietary Diversity for Women (MDD-W) was found to be in 45% of the mahila police as they reported consumption of 5 or more food groups on the day of data collection.

Bansah G (2022) examined an evaluation of Eating Pattern and Nutritional Status of Police Personnel in the Tamale Metropolis in Ghana. The study revealed that the police eat two main meals, skip breakfast or eat in between meals, consume alcohol, In the week preceding the survey, about 86%, 71%, 61% and 50% ate foods belonging to the meat, soft drinks, fish, grain and eggs groups' ≥3 times respectively. About 92%, 89% and 84% of the respondents ate foods belonging to vegetables, fruits, and roots and tubers <3times respectively in the week . In terms of dietary diversity, the majority (48.7%) of the police had medium dietary diversity followed by high dietary diversity (25.8%) while 25.5% had low dietary diversity.

Aparna Nagendra (2019) conducted a study on Dietary Habits and Nutritional Screening of Bangalore City Police that say 78% were nonvegetarians and most of them skipped their meals (55%) and also followed an irregular meal pattern.

Physical activity

It was found that 30.4% of participants had a fitness regimen that included daily gym or yoga. The majority of the mahila police reported to handle household activities such as cleaning utensils, mopping, sweeping, cooking, washing clothes, and taking care of children on their own. This shows moderate physical activity done by Mahila police. The mean BMI of the Mahila Police was reported as 22.6 kg/m² with a standard deviation of ±4.02.

Similar study conducted by **Aparna Nagendra (2019)** on Dietary Habits and Nutritional Screening of Bangalore City Police that say Mean BMI was found to be 26 kg/m2 ± 2.9. It was reported that 75% had a sedentary lifestyle, with no exercise.

Overall, the study underscores need for nutrition health education programmes or intervention that can improve their nutritional status, dietary diversity and dietary choices. Addressing these gaps will be crucial in reducing malnutrition, preventing anemia, and improving the overall health outcomes of women and Police force in India.

SUMMARY AND CONCLUSIONS:

SUMMARY:

Women police officers face unique physical, mental, and emotional challenges due to the demanding nature of their profession. Ensuring they are nutritionally, mentally, and physically fit is essential for their performance, endurance, decision-making, and overall well-being. Proper nutrition is not just about staying fit, it's about survival, resilience, and peak performance. A well-planned diet and awareness on nutrition and dietary diversity can enhance physical strength, mental clarity, emotional stability, and long-term health, allowing them to serve effectively while maintaining their well-being

The study was aimed with a broad objective to assess the nutritional status, knowledge about nutrition, dietary practices and impact of counselling on dietary practices of Mahila police of urban Vadodara.

Specific Objectives were:

- To assess the background information of mahila police from selected police stations of urban Vadodara.
- To assess the anthropometry based nutritional status of mahila police and prevalence of anemia (secondary source) in mahila police
- To assess the knowledge on selected aspect of nutrition and dietary practices of Mahila police.
- To conduct counselling sessions for 8 weeks (once weekly for 1-2 hrs. with IEC material) to Mahila police of enrolled police station of Vadodara.
- To see the impact of sensitization on mahila police for changes in their dietary practices.

The study was divided into 3 phases:

- **Phase – I** Baseline Assessment
- **Phase – II** Sensitization of Mahila Police
- **Phase – III** Impact Evaluation

Study site: Urban Vadodara

Study Population: Mahila Police

Intervention period: 8 weeks

Phase I- Baseline assessment

Vadodara City Police is organized into 4 zones i.e. Central, East, West and North zone. It is divided into 8 divisions (A, B, C, D, E, F, G and H) which is further divided into 26 police stations. Twelve police stations were selected randomly. Each Police stations has 25-30 Mahila Police.

For the study 191 Mahila police were enrolled from 12 police stations.

Following data were collected from all the enrolled mahila police:

- Socio demographic Profile of Mahila Police
- Anthropometry based nutritional status and prevalence of Anemia among mahila police
- Knowledge on selected aspect of Nutrition among Mahila Police
- Dietary practices of Mahila Police
- Physical activity among Mahila Police

Highlights of the findings -Section 1

Socio-Demographic Profile of Mahila Police:

Total 191 Mahila police from 12 police stations were enrolled from urban Vadodara for the study.

The mean age of the Mahila Police is 32 ± 7.56 years.

Around 61% completed their graduation followed by 30% with post-graduation degrees (29.8%), and 9.4% have studied up to higher secondary level.

Approximately 86.3% of the Mahila Police belong to reserved categories.

Abdominal obesity was found in 36 respondents (19%).

41.3% fall under the normal BMI category the normal weight category, while 29.8% are overweight, 15.1% are obese, and the remaining 13.6% suffer chronic energy deficiency.

The mean hb levels were 10.8±1.47 sd g/dl with 49% percent those who are mild anemic(10-12g/dl), followed by 43.1% moderately anemic(7-9g/dl) ,3.6% were severely anemic (<7g/dl) and 3.6% were non-anemic with >12g/dl hb levels.

Knowledge and dietary practices among Mahila police

Only 21.4% had correct understanding of good health. Awareness of different food groups was reported by 92.14%.

Awareness of the term undernutrition was noted in 86.3%, with descriptions including low birth weight (31.4%), inability to work properly (65.9%), and being unhealthy (15.1%).

Awareness of the term overnutrition was noted in 65%, while 34.5% were not familiar with it.

91% of mahila police suggested the causes of anemia as inadequate consumption of iron rich foods in the diet and to consume iron folic acid by 40% at baseline.

90.6% of respondents consumed junk food, with preferences including packed foods (89.5%), fried snacks (87.9%), carbonated drinks (54.9%), and sweets (67%).

Protective rich foods like Vitamin A rich fruits and dark leafy vegetables consumed by only 3.1% and 21% of the respondents

Minimum Dietary Diversity for Women (MDD-W) was found to be in 45% of the mahila police as they reported consumption of 5 or more food groups from 24 hr. dietary recall

Phase II: Sensitization of Mahila Police with IEC material on concepts of Nutrition and Health among Mahila Police

Development of Training module and PowerPoint presentations. Based on the knowledge and practices among Mahila Police, topics were identified for orientation to them. A Training module was developed. Topics for the sensitization were:

1. Basics of Nutrition and health
2. Concept of healthy diets and Dietary diversity
3.Importance of micronutrients for the body
4.Anemia and its prevention
5.NCDs
6.Consequences of junk foods
7. Importance of Physical Fitness
8.Advantages and disadvantages of social media on food consumption.

PowerPoint presentations were made for sensitizing mahila police Sensitization of Mahila Police on topics of Nutrition and health for 8 weeks (once a week for 1-2 hour) in hybride mode.

Sensitization of Mahila police on nutrition and health.

In all, 12 Police station and 191 mahila police were enrolled for the study. Out of which 6 Police station were randomly selected for intervention. Total of 101 Mahila police of 6 police station served as experimental group and 90 Mahila police of another 6 police station served as control group. Sensitization Of Mahila police was done for 8 weeks (1-2 hour weekly)

Highlights of the findings: - Section II

A total of 101 Mahila police from 6 police station were given counselling sessions for 8 weeks (once a week for 1-2 hours) through Ppts and training module in hybrid mode.

Total 8 sessions and 1 revision session for counselling was conducted in hybrid mode.

Phase III – Impact evaluation

Knowledge retention on selected nutrition and health components and change in dietary practices among Mahila police was assessed.

After imparting all the 8 sensitization sessions among mahila police, a revision class was conducted in which all the topics were discussed in brief. To evaluate the impact of the training post data was collected on their knowledge retention related to Nutrition and food groups among Mahila Police, malnutrition, consumption of protective food groups, anemia, NCDs, dietary diversity, change in dietary practices, Minimum Dietary Diversity of Women (MDD-W) of Mahila Police, food groups consumed, change in Physical Activity patterns.

Highlights of the Findings – Section III

Daily fruit consumption among Mahila police officers showed that 97% consumed fruit daily in the experimental group post-intervention which was significant

In the pre-experimental group, 39.6% of the Mahila police had an MDD-W, meaning they consumed a minimum of 5 out of 10 food groups. After the intervention, which improved to 85%, which was significant.

Post-intervention results indicated that 90% of the experimental group did not consume beverages such as tea/coffee with breakfast which was significant.

Significant Reduction in consumption of processed was also reported post intervention.

Increase in water consumption was reported, with 44.6% consuming over 1.5 liters, 38.6% drinking more than 1 to 1.5 liters, 15.8% consuming 700-1 liter, and 3.3% exceeding 2 liters

46.7% in the experimental group who did 30 mins of physical activity such as gym/yoga class regularly.

Significant improvement was seen in screen time from >2 hours to 1-2 hours.

CONCLUSION:

From the findings of the current study, following conclusions can be drawn:

- Dual burden of malnutrition co-exists in Mahila Police which is a cause of concern
- Sensitization on selected aspects of nutrition and dietary practices improved the knowledge on basics of Foods and nutrition, dietary diversity and dietary practices.
- There is a need for regular Nutrition health promotion for nutrition literacy of the mahila police to improve quality of life including their nutritional status.

RECOMMENDATIONS:

It is recommended that the police department should implement health education programs to promote awareness of the benefits of good dietary practices for achieving optimal health.

POLICY-LEVEL INTERVENTIONS

- Data generated from the study may help district police authority to plan worksite wellness programme for mahila police and other staff of the department or achieving health for all to facilitate some of the targets of SDG 3.

DISSEMINATION OF FINDINGS:

An effort was made to present some of the findings of the study at **International Conference on Occupational Health and Safety Measures (2025)** which was held on 20-21st March. The topic for the presentation was "Nutritional status and dietary diversity of Mahila Police of urban Vadodara, Gujarat, India.

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DEPARTMENT OF HOME SCIENCE
CERTIFICATE

This is to certify that Dr/ Mr./Ms./ Mrs. Sweta Patel, Dept of Food and Nutrition
The Maharaja Sayajirao University of Baroda has participated as Resource person/ Delegate / Paper Presenter / Rapporteur. The title of the paper Nutritional Status and Dietary Diversity of Mahila Police of Urban Vadodhara in the International Conference organized by the Department of Home Science, Gandhigram Rural Institute Deemed To Be University, Gsandhigram on 20 th and 21st March 2025.

Dr. K.S. PUSHPA
Senior Professor & Head
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OHAS

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Appendix I

Institutional Ethics Committee for Human Research (IECHR)

FACULTY OF FAMILY AND COMMUNITY SCIENCES
THE MAHARAJA SAYAJIRAO UNIVERSITY OF BARODA

Ethical Compliance Certificate 2024-2025

This is to certify Ms. Sweta Patel study titled; "Mahila police of Vadodara city: Assessment of nutritional status, knowledge on nutrition, dietary practices and impact of counselling on dietary practices." from Department of Foods and Nutrition has been approved by the Institutional Ethics Committee for Human Research (IECHR), Faculty of Family and Community Sciences, The Maharaja Sayajirao University of Baroda. The study has been allotted the ethical approval number IECHR/FCSc/M.Sc./10/2024/51.

Komal

Prof. Komal Chauhan
Member Secretary
IECHR

Prof. Mini Sheth
Chairperson
IECHR

Chair Person
IECHR
Faculty of Family & Community Sciences
The Maharaja Sayajirao University of Baroda

Appendix II

પોલીસ કમિશ્નરની કચેરી, વડોદરા શહેર
પોલીસ ભવન,રાવપુરા વડોદરા શહેર
કચેરી ટે.નં. ૦૨૬૫-૨૪૩૧૭૧૭, ફેકસ નં.૨૪૩૨૫૮૨
e-mail : dcp-admin-vad@gujarat.gov.in

આઝાદીનો અમૃત મહોત્સવ

કમાંક:પીએ/નાપોકમિ(વ)/કાઉન્સેલિંગ/૧૫૬/૨૪
વડોદરા શહેર. તા. ૭ /૧૦/૨૦૨૪.

વિષય: વડોદરા શહેરની મહિલા પોલીસ પર આહારની પદ્ધતિઓ અને આહાર પ્રથાઓ પર કાઉન્સેલિંગ બાબત.

ઉપરોકત વિષય અન્વયે જણાવવાનુ કે, આપના તરફથી મે. પોલીસ કમિશ્નરશ્રી, વડોદરા શહેર નાઓને મહિલા પોલીસ પર સંશોધન કરવા માટે તા.૨૫/૦૯/૨૦૨૪ના રોજના રોજ મૌખિક સંદેશાવ્યવહાર મુજબ, વિગતવાર દરખાસ્ત સાથે આવેલ. જે મહિલા પોલીસ પાસેથી એકત્ર કરવાની માહિતી પણ પ્રશ્નાવલી જોડવામા આવેલ છે.

જે તેઓ આપને અભ્યાસ હાથ ધરવા અને સંબંધિત પોલીસ સ્ટેશનો કાઉંસેલિંગ કરી વિગતવાર રિપોર્ટ સબમિટ કરવા તથા સંશોધન પ્રકાશન માટે મંજુરી માંગવામા આવેલ છે.

ઉપરોકત કાઉન્સેલિંગ અંગેની તમામ જવાબદારી આપના માર્ગદર્શન હેઠળ MSU ના ખોરાક અને પોષણ વિભાગના Sr. M.Sc ડાયેટિક્સ વિભાગમાંથી મિસ સ્વેતા પટેલ. હેમાંગીની ગાંધી અભ્યાસનું સંચાલન કરશે. તથા અત્રેની કચેરીને સમયાંતરે આપના દ્વારા કરવામા આવતી કામગીરીનો અહેવાલ પાઠવવો. તથા અત્રેની કચેરીની મંજુરી વગર અહેવાલ પ્રસિધ્ધ કરી શકાશે નહી.

" પો. કમિ.શ્રી નાયબના આદેશ થી"

(તેજલ પટેલ)
નાયબ પોલીસ કમિશ્નર
વહિવટ અને મુખ્ય મથક
વડોદરા શહેર

પ્રતિ
(૧). આસિસ્ટંટ પ્રોફેશર, ફેકલટી ઓફ ફુડસ એન્ડ ન્યુટ્રીશન ડિપાર્ટમેન્ટ, એમ.એસ.યુનિ., વડોદરા.
(૨). પોલીસ ઇન્સપેકટરશ્રી,
સયાજીગંજ, ફતેગંજ, ગોત્રી, અકોટા, મકરપુરા, વાડી, કારેલીબાગ, સમા, વદોદરા શહેર.

૨/- જરૂરી સહકાર તથા કાર્યવાહી સારૂ

સવિનય નકલ રવાના:-
અધિક પોલીસ કમિશ્નરશ્રી ઝોન-૩, નાયબ પોલીસ કમિશ્નરશ્રી ઝોન-૧,૨,૪ વડોદરા શહેર.
અંગત મદદનીશ ટુ પોલીસ કમિશ્નરશ્રી, વડોદરા શહેર.

પોલીસ કમિશ્નરની કચેરી, વડોદરા શહેર, વડોદરા.
પોલીસ ભવન, જેલ રોડ, વડોદરા ૩૮૨૦૦૯.
Ph.૦૨૬૫-૨૪૩૩૯૯૯/૨૪૩૫૯૪૭,
Fax.૨૪૩૨૫૮.
E-Mail ID: cp-vad@gujarat.gov.in

ક્રમાંકઃ ક-૧/કાઉન્સેલિંગ/૨૨૬૫૮/૨૦૨૪ તા.૩૦/૧૨/૨૦૨૪

વિષય : વડોદરા શહેરની મહિલા પોલીસ પર આહારની પદ્ધતિઓ અને આહાર પ્રથાઓ કાઉન્સેલીંગ બાબત

ઉપરોકત વિષય અન્વયે જણાવવાનું કે, આપના તરફથી મે. પોલીસ કમિશ્નરશ્રી, વડોદરા શહેર નાઓને મહિલા પોલીસ પર સંશોધન કરવા માટે તા.૨૫/૦૯/૨૦૨૪ના રોજ મૌખિક સંદેશાવ્યવહાર મુજબ, વિગતવાર દરખાસ્ત સાથે આવેલ. જે મહિલા પોલીસ પાસેથી એકત્ર કરવાની માહિતી પણ પ્રશ્નાવલી જોડવામા આવેલ છે.

૨/- જે તેઓ આપને અભ્યાસ હાથ ધરવા અને સંબંધિત પોલીસ સ્ટેશનો કાઉસેલિંગ કરી વિગતવાર રિપોર્ટ સબમિટ કરવા તથા સંશોધન પ્રકાશન માટે મંજુરી માંગવામાં આવેલ છે.

૩/- ઉપરોકત કાઉન્સેલિંગ અંગેની તમામ જવાબદારી આપના માર્ગદર્શન હેઠળ MSU ના ખોરાક અને પોષણ વિભાગના Sr. M.Sc. ડાયેટિક્સ વિભાગમાંથી મિસ સ્વેતા પટેલ. હેમાંગીની ગાંધી અભ્યાસનું સંચાલન કરશે તથા અત્રેની કચેરીને સમયાંતરે આપના દ્વારા કરવામા આવતી કામગીરીનો અહેવાલ પાઠવવો

૪/- અત્રેની કચેરીની મંજુરી વગર અહેવાલ પ્રસિદ્ધ કરી શકાશે નહી.

" આ. પો. કમિ. શ્રી નાઓનાં સમાટેશથી."

(તેજલ પટેલ)
નાયબ પોલીસ કમિશ્નર
વહીવટ અને મુખ્ય મથક
વડોદરા શહેર, વડોદરા

પ્રતિ,

- આસિસ્ટંટ પ્રોફેશર, ફેકલટી ઓફ ફુડસ એન્ડ ન્યુટ્રીશન ડિપાર્ટમેન્ટ, એમ.એસ.યુનિ., વડોદરા.
- પોલીસ ઈન્સપેકટરશ્રી,
  (૧) મહિલા પો.સ્ટે. (૨) માંજલપુર (૩) છાણી (૪) અટલાદરા, વડોદરા શહેર, વડોદરા
  ૨/- જરૂરી સહકાર તથા કાર્યવાહી સારૂ

સવિનય નકલ રવાનાઃ-

- નાયબ પોલીસ કમિશ્નરશ્રી ઝોન-૧,૨,૩. વડોદરા શહેર.
- અંગત મદદનીશ ટુ પોલીસ કમિશ્નરશ્રી, વડોદરા શહેર.

Appendix III

सत्यं शिवं सुन्दरम्
Estd. 1949,
Accredited Grade "A+" by NAAC

DEPARTMENT OF FOODS AND NUTRITION
FACULTY OF FAMILY AND COMMUNITY SCIENCES
THE MAHARAJA SAYIJIRAO UNIVERSITY OF BARODA
VADODARA 390002-INDIA

સંમતિ ફોર્મ

પ્રિય સહભાગી,

ફેમિલી એન્ડ કોમ્યુનિટી સાયન્સ ફેકલ્ટી ઓફ ફૂડ્સ એન્ડ ન્યુટ્રિશન ફેકલ્ટી, MSU વિભાગ "વડોદરા શહેરની મહિલા પોલીસ: પોષણની સ્થિતિનું મૂલ્યાંકન, પોષણ પરનું જ્ઞાન, આહારની પદ્ધતિઓ અને આહાર પદ્ધતિઓ પર કાઉન્સેલિંગની અસર" પર અભ્યાસ હાથ ધરવા માંગે છે.
આના ભાગરૂપે, અમે અભ્યાસ માટે વડોદરાના પસંદગીના પોલીસ સ્ટેશનોની મહિલા પોલીસની નોંધણી કરવા માંગીએ છીએ. અમે પોષણની સ્થિતિનું મૂલ્યાંકન કરીશું, પોષણના પસંદ કરેલા પાસાઓ અને આહાર પદ્ધતિઓ વિશેના જ્ઞાનનું મૂલ્યાંકન કરીશું. સર્વેક્ષણ પછી અમે મહિલા પોલીસને તેના માટે માહિતગાર કરવા માંગીએ છીએ.
આ માટે ૧૦-૧૫ મિનિટનો સમય લાગશે. જો તમે જવાબ આપવા માંગતા ન હોવ તો તમે અભ્યાસના કોઈપણ સમયે ના પાડી શકો છો.આ માહિતી ગોપનીય રાખવામાં આવશે અને તેનો ઉપયોગ માત્ર સંશોધન હેતુ માટે જ કરવામાં આવશે. જો તમને કોઈ પ્રશ્ન હોય તો તમે નીચેના ફોન નંબરો પર સંપર્ક કરી શકો છો.
તેથી કૃપા કરીને અભ્યાસ માટે સંમતિ આપો.

અભ્યાસ નિરીક્ષક,
નામ: ડો. હેમાંગીની ગાંધી
સંપર્ક નં.: 9824320554

સંશોધન વિદ્યાર્થી,
નામ: સ્વેતા પટેલ
સંપર્ક નં.: 8511343642

સભ્ય સચિવ,
સંસ્થાકીય નૈતિક સમિતિ ફેકલ્ટી ઓફ ફેમિલી એન્ડ કોમ્યુનિટી સાયન્સ
નામ: પ્રો. કોમલ ચૌહાણ
સંપર્ક નં.: 9898790340

હું _____ મહિલા પોલીસ અભ્યાસ માટે માહિતી પ્રદાન કરવા માટે સંમતિ આપું છું.

મહિલા પોલીસની સહી_____

તારીખ _____ સ્થળ _____

Appendix IV

Pre Questionnaire

SES Questionnaire:

Date: -	**Name Of Police station: -**
Division -	**Address: -**

Sr. No.	Questions	
1.	Name Of Mahila Police	
2.	Email	
3.	Contact no.	
4.	Date of birth	
5.	Age (yrs)	
6.	Religion	1. Hindu 2. Muslim 3. Other: _____
7.	Caste	1. General 2. SC 3. ST 4. OBC
8.	Economic category	1.APL 2.BPL
9.	Marital Status	1. Married 2. Unmarried 3. Widow 4. Separated 5. Divorce

10	Qualification	1. Post Graduate 2. Graduate 3. Diploma 4. Higher secondary
11	Designation	1. Police inspector 2. Police sub inspector 3. Assistant Sub inspector 4. Head constables 5. Other specify_____
12	Type of Family	1.Nuclear 2.Joint 3.Extended nuclear
13	Number of family members	
14	Office timings	
15	Working hours per day	
	Medical History	
16.	Do you have any allergies?	1.yes 2.No
17.	Do you suffer from any of diseases listed? (check present laboratory report)	1. Obesity 2.Diabetes 3. Hypertension (BP) 4.Arthritis 5. Thyroid 6.Asthma 7.Cancer 8.Other specify_____ 9..None
18.	Do you have any Addiction?	1.Yes 2.No If yes then choose

		a) Tobacco, b) Paan, c) Ghutka, d) Smoking, e) Alcohol etc)
19.	**Anthropometry Measurements**	
20.	Height (in cms)	
21.	Weight (kg)	
22.	BMI (kg/m^2)	
23.	Waist circumference(cm)	
24	Hip circumference(cm)	
25.	Waist hip ratio	
26.	Blood pressure (mmhg)	
27.	Hb(from the report)	

KNOWLEDGE ON NUTRITION AND DIET RELATED PRACTICES:

1.Date:

2.Name:

	Questions	**Choose from responses/write responses**	**CODE**
3	According to you what is good health	1.disease free 2.Able to do work 3. one who is mentally, physically fit without any disease 4.other specify_____	
4	Do you know about food groups?	1.yes 2.no	
5.	If yes, what are the following food groups	1.cereals 2.Milk and milk products 3.Meat 4.Eggs 5.vegetables 6.fruits 7.roots and tubers 8.nuts and oil seeds 9.sugar 10.others specify_____ 0.dont know	
6.	According to you what is balanced diet?	1.Diet which includes cereals, pulses, milk and milk products, fruits, vegetables and egg/fish/meat, oil, ghee etc is present 2.Includes every food group and meets daily nutritional requirement 3.Others , please specify----------	
7.	What are functions of food?	1.providing energy 2.Helping our bodies grow 3.Increases immunity 3.Keeping our bones healthy 4.Others, please mention 0.Dont know	
9.	Which foods provide energy?	1.Whole grains 2.oil/ghee 3.Sugar/jaggery 4.Others, please Mention 0.Dont know	

10	Which food provides energy and helps in muscle building	1.pulses and legumes 2.Non veg and egg 3.Others , please mention 0.Dont know	
11.	Which foods protects against diseases?	1.Fruits + Vegetables 2.Cereals+pulses 3.Any other, specify 0.Dont know	
12.	Which food group is important for bones and joints	1.pulses and legumes 2.Egg/ Mutton/ fish 3.Milk and milk products like curd, ghee, cheese, buttermilk, paneer etc.	
13	What are major nutrients?	1.carbohydrate 2.Protein 3.Fats 4.Vitamins 5.Minerals 6.Others, please mention_____ 0.dont know	
14.	What if we don't take balanced diet?	1.Undernutrition 2.Overeating and obesity 3 Deficiency of vitamins and minerals 4.Non communicable diseases like diabetes, blood pressure and heart disease, cancer etc. 5.Others, please mention 0. Don't know	
15.	Do you know what undernutrition is?	1.yes 2.No	
16.	If yes, what is undernutrition?	1.Low weight for age 2.Can't work properly, Weakness 3. Being unhealthy 4. Any other specify 0.dont know	
17.	What are the reasons for undernutrition?	1.frequent illness 2.poverty 3.Low birth weight 4.Lack of food 5.Lcak of awareness about what to eat 6.Any other specify 0.Dont know	

18	What are the preventive measures for undernutrition?	1.To consume balanced diet regularly 2.to keep home and village clean 3.To avail the benefits of government services 4. any other specify 0.Dont know	
19	Do you know what overnutrition is?	1.yes 2.No	
20	If yes, what is overnutrition	1.obesity 2.overeating 3.being unhealthy 4.Any other specify 0.Dont know	
21	What are consequences of malnutrition (under + over nutrition)	1.lethargy 2.low productivity 3.NCDs 4.any other specify 0.dont know	
22.	What are the reasons for overnutrition?	1.Stress 2.overeating 3.excess intake of nutrients 4.any other specify 0.Dont know	
23	What happens if you are suffering from overnutrition?	1.Daibetes 2.blood pressure 3.heart diseases 4.Arthritis 5.others specify 0.dont know	
24	How many fruits you should eat in a day?	1.one 2.Two 3.Any other specify 0.Dont know	
25	How much vegetables you should eat in a day? (show standard cups)	1.400 grams 2.500 gms 3.1 katori 4.2 katories 5.c1 6.c2 7.c3 8.c4 9. any other specify 0.Dont know	

26	How much milk/milk products you should eat in a day?	1.500 ml 2.1 cup 3.2 cups 4.250 ml 5.C1 6.C2 7.C3 8.C4 9.Any other specify 0.Dont know	
27	How much fats/oil you should consume in a day? (show standard spoons)	1.4tsp oil and 2 tsp ghee 2.S1 3.S2 4.S3 5.S4 6.Any other specify 0.Dont know	
28	How much sugar you should consume in a day?(show standard spoons)	1.4tsp sugar 2.S1 3.S2 4.S3 5.S4 6.Any other specify 0.Dont know	
29	Why is morning breakfast important?	1.Keeps you active 2.Improves attention and performance on workplace 3.You do not suffer fatigue, nausea and headache 4.Any other specify 0.Dont know	

	KNOWLEDGE ON ANEMIA		
	Questions	**Choose from responses/ Write responses**	**Write code**
1	Have you heard about the term anaemia?	1. Yes 2. No	
2.	If yes, then what is anaemia?	1. Low haemoglobin levels in the blood 2. Paleness of eyes, nails, tongue 3. Weakness 4. Any other	

3.	What are the causes of anemia? ***(Probe and read out the options to make them understand)***	1. Inadequate consumption of Iron Rich Foods in theDiet 2. Consumption of Iron Rich Foods with inhibitors likeTea and Coffee 3. Excessive blood loss as in menstruation, delivery, haemorrhage 4. Blood loss during accidents 5. Frequent Episodes of Malaria 6. Hookworm Infestations 7. Any other specify 0. Don't know	
4	What are the signs and symptomsof anaemia? ***(Probe and read out the options to make them understand)***	1. Fatigue 2. Weakness 3. Pallor of skin, tongue and nails 4. Shortness of breath 5. Dizziness 6. Brittle and spoon-shaped nails 7. Headaches 8. Fast irregular heartbeat 9. Swelling and soreness of the tongue 10. Cold hands and feet 11. Tingling sensations in legs 12. Any other specify 0. Don’t know	
5	What are the preventive measuresfor Anaemia? ***(Probe and read out the options to make them understand)***	1. Consumption of Iron Rich Food with enhancers anddietary diversity 2. Consume Iron Folic Acid Tablets 3. Prevention of Malaria 4. Cleanliness of house inside and outside 5. Consume Albendazole tablets twice a year 6. Eat Purna Shakti packets 7. Any other specify 0. Don’t know	
6.	According to you, which are the iron rich sources of food?	1. Green leafy vegetables 2. Whole cereals and Pulses 3. Dates 4. Beet 5. Soybean	

		6. Jaggery 7. Egg/Meat/ Fish 8. Any other specify 0. Don't know	
7.	Which foods should be consumed with iron rich foods?	1. Vitamin C-rich foods- Amla/ lemon/ orange/ guava 2. Any other specify 0. Don't know	
8	Which foods should not to be consumed with iron rich foods?	1. Tea or coffee 2. Any other specify 0. Don't know	
9	Have you heard about Non communicable diseases?	1.yes 2.No	
10	If yes, what are the common NCDs?	1.diabetes 2.Obesity 3.Hypertension 4.Heart Diseases 5. cancer 6.Chronic Lung Diseases 7.any other specify	
11	What are the common risk factors of NCDs?	1.Unhealthy eating habits-diet high in sugar and salt and fat 2.Diet low in fruits and vegetables 3.Physical inactivity 4.being overweight/obese 5.Addiction like tobacco, drug and alcohol 6.Stress 7.Low consumption of fruits and vegetables 8.High consumption of HFSS 9.Any other specify 0.Dont know	
12	How to prevent NCDs?	1. Maintaining a healthy body weight 2. Be physically active regularly 3. Maintain a healthy balance in your diet 4. Do not include too much fat/ sugar/ salt in your diet 5. Eat foods that are high in fibre (salads, fruits, whole grains, cereals, whole pulses and its products) 6. Avoid tobacco use, drug and	

		alcohol abuse 7. Avoid consuming aerated drinks 8. Read the food label on packaged food items like information about the nutritional value of a food and shelf-life of the food product 9. Manage stress 10. Any other specify 0. Don't know	
13.	What are risk factors for Diabetes	1.obesity 2.genetics 3.physical inactivity 4.excessiveconsumption of HFFSS food 5.Ethnicity 6.Age 0.Dont know	
14	What are risk factors for Hypertension (BP)?	1.obesity 2.lack of exercise 3.unhelathy diet 4.excessive consumption of HFFSS food 5.Ethnicty 6.Age 0.Dont know	

	Dietary practices		
	Questions	**Choose from responses/write responses**	**Write code**
15	What is your type of diet?	1. Vegetarian 2. Non-Vegetarian 3. Eggetarian 4.Lacto Ovo	
16	What is diet diversity?	1.Consuming a wide variety of foods and food groups 2. Eating the same foods every day 3.Focusing only on protein-rich foods 4. Eliminating all carbohydrates from the diet	

17	How do you achieve diet diversity in daily life?	1.Eating Variety of foods including every food group 2. Focusing exclusively on one food group 3.Trying new foods and recipes 4.Skipping meals	
18.	Do you buy any junk food/packaged food?	1. Yes 2. No	
19	If yes, what do you prefer to buy?	1. Packed snacks (Potato/ banana wafers, Kurkure, Gopal) 2. Fried snacks (samosa, bhajiya, kachori, panipuri) 3. Carbonated drinks ThumsUp,7 Up, Pepsi, Coca-Cola, Limca) 4. Sweets (burfi, laddoo, pastries/ cakes, chocolates, ice cream, biscuits) 5. Any other specify	
20	If yes, how much money do you spend in a day to buy junk foods/packaged foods?		
21	Write down the food items and ingredients consumed on the previous day		

	Meal and timing	**Food Items**	**Ingredients**
	Breakfast		
	Mid Morning		

	Lunch Time		
	Evening Snack		
	Dinner		
	Any other item if consumed (Packets, outside home)		

22	List food groups from the above recall. (From 24hr dietary recall) (To be done by research student)	1. Grains, white roots and tubers, and Plantains 2. Pulses (beans, peas and lentils) 3. Nuts and seeds 4. Dairy 5. Meat, Fish and poultry 6. Eggs 7. Dark green leafy vegetables 8. Vitamin A-rich fruits and vegetables 9. Other vegetables 10. Other fruits	
Physical activity Questions			
23	Do you go gym regularly or any fitness club?		
24	Do u go walking or jogging after office hours?	1.yes 2.No	
25	By what mode of transport, you go to work?	1.2-wheeler 2.4-wheeler 3. Government transport 4.Rickshaw 5.other specify	
26	Being a police officer What type of exercise you do ?		
27	How many days you exercise in a week?		
28	Usually how much time you spent on sitting or reclining?		

29	Choose the household activities you do (not the maid)	1.Cleaning utensils 2.Mopping and sweeping 3.cooking 4. washing clothes 5.Taking care of children 6.None	
30	Do you have maid at house?	1.parttime 2.full time	
31	At what time generally you wake up?		
32	What are your sleeping hours usually?		
33	How much time do you spend on social media (Instagram, WhatsApp, Snapchat etc.)		

24-hour dietary recall

Time	Meals	Food	Ingredients
	Early morning		
	Breakfast		
	Brunch		
	Lunch		
	Evening snack		
	Dinner		

Added Questions for post Questionnaire

SR.no	Questions	Multiple options	Code no.
1	Meals in a day	1.Breakfast 2.Brunch 3.Lunch 4.Evening snack 5.Dinner 6.supper	
2.	Frequency of eating junk food	1.once a week 2.twice a week 3.Thrice a week 4.NA	
3.	Do you consume fruit daily?	1.yes 2.No	
4.	Do you still consume tea/ coffee with breakfast?	1.yes 2.No	

APPENDIX V

Training module for Mahila Police:

આરોગ્ય અને પોષણ ની માગદર્શિકા

ફુડ્સ એન્ડ ન્યૂટ્રિશન, ફેમિલી એન્ડ કમ્યૂનિટી સાયન્સીસ, MSU

તકનિકી નિષ્ણાત: ડૉ. હેમાંગીની ગાંધી (આસિસ્ટન્ટ પ્રોફેસર)

રીસર્ચ સ્ટુડન્ટ: સ્વેતા પટેલ (Sr. MSC DIET)

FORWARD

The nutirtional status of working women is a major concern.

Faultry dietary practices which may lead to micro nutrient deficiency like anemia, non communicable disease like obesity, diabetes, high bp.
Faultary dietary practices may result in less productivity among working women.
We department of foods and nurition,FFcSc MSU as part of dessertation working with mahila police of selected police stations of urban vadodara.

Based on prelimnary survey of dieatry practices of mahila police certain gaps were identified.

To provide correct knowledge about basics of foods and nutrition and to sensitize them to change their ditary practices for maintaing healthy life through out the life cycle, we have tried to preparae poshan and arogya magdarshika for mahila police. The guieline includes various topics like

1. Basics of Nutrition and health

2. Concept of healthy diets and Dietary diversity

3.Importance of micronutrients for the body

4.Anemia and its prevention

5.NCDs

6.Consequences of junk foods

7. Importance of Physical Fitness

8.Advantages and disadvantages of social media on food consumption

We hope that this guideline will help mahila police and others to understand correct dietary practices to follow ,for them and their family members.

Research Guide: Hemangini Gandhi
Research student :Sweta Patel

અનુક્રમણિકા

	• ખોરાક માં લોહિતત્વ ક્યાંથી મળે? એનિમિયા કેવી રીતે અટકાવી શકાય/નિવારણ પગલાં	
5.	**બીન સંક્રમિત રોગો :** • બીજ સંક્રમિત રોગો એટલે શું? • જોખમી પરિબળો શું છે? • આજ સે થોડા કામ એટલે શું? • ફંકશનલ ફૂડ્સ ની ભૂમિકા	
6.	**જંક ફૂડના અડાસર**	
7	**શારીરિક પ્રવૃત્તિ અને કસરત** • કસરત નું મહત્વ • કસરત ના વિવિધ પ્રકારો	
8	**સોશિયલ મીડિયા ના ફાયદા અને ગેરફાઇડા**	

1) પોષણ એટલે શું?

પોષણ એ એક એવી પ્રક્રિયા છે, જેમાં ખોરાકમાંથી જરૂરી પોષક તત્ત્વો મેળવીને તેનો ઉપયોગ વૃદ્ધિ, વિકાસ, ઉર્જા અને આરોગ્ય જાળવવા માટે કરે છે.

સ્વાસ્થ્ય

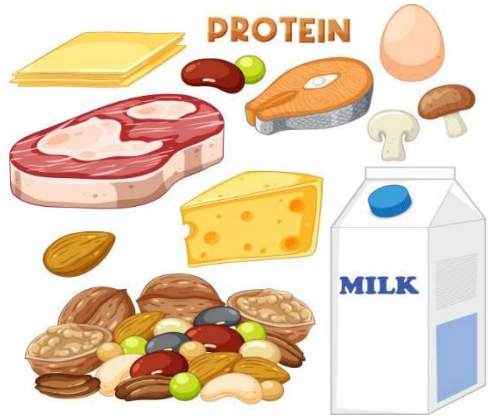
વિશ્વ આરોગ્ય સંસ્થા પ્રમાણે સ્વાસ્થ્ય એટલે શારીરિક, માનસિક અને સામાજિક રીતે સંપૂર્ણ તંદુરસ્તી અને કોઈ પ્રકાર ની બિમારીયો ના હોવી.

પોષણ સ્થિતિ (ન્યૂટ્રિશનલ સ્ટેટસ)એટલે વ્યક્તિના શરીરનો પોષણ સ્થર સંબંધી સ્થિતિનો દર્જો, જે તેની ખોરાક શૈલી, શરીર દ્વારા પોષક તત્ત્વોનો શોષણ અને ઉપયોગ, તેમજ આરોગ્ય પર તેની અસરના આધારે નક્કી થાય છે.

1. **મુખ્ય પોષક તત્ત્વો (Macronutrients)**
   a) કાર્બોહાઈડ્રેટ આપણને ઊર્જા અને ફાઈબર આપે છે

અનાજ: ઘઉં, ઘઉંનો લોટ, ચોખા, ચોખાના ટુકડા, મકાઈ, જવ, ઓટ્સ (જય), સુજી, વર્મિસેલી (સેવિયન), ફૂલેલા ચોખા વગેરે.
મિલેટ્સ (બરછટ ધાન્ય): જુવાર, રાગી, કોદરી, સામો, બાજરી વગેરે.
તે કાર્બોહાઈડ્રેટથી સમૃદ્ધ છે.

b). પ્રોટીન



શરીરના ઉછેર, મરામત માટે જરૂરી.
દાળ અને કઠોળ: ચણા દાળ, ચણાનો લોટ (બેસન), મગની દાળ, કાળા ચણા, અડદની દાળ, તુવેર દાળ, ચણા (સફેદ/કાળી/લીલા ચણા), ફણગાવેલા કઠોળ, રાજમા, ચોડી, સોયાબીન, ઈંડા,મછલી,મરઘી,માંસ વગેરે.
તે પ્રોટીનથી સમૃદ્ધ છે.

c). **ફેટ (ચરબી)**: ઊર્જા પૂરી પાડે છે, કોષોની રચનામાં મદદ કરે છે અને વિટામિન શોષણ માટે જરૂરી છે. **ચરબી/તેલ, ખાંડ અને સૂકા મેવા.**

2. સુક્ષ્મ પોષક તત્ત્વો (Micronutrients)
ઓછા પ્રમાણમાં જરૂર હોય છે, પરંતુ શરીર માટે અત્યંત મહત્વપૂર્ણ છે:

- **વિટામિન્સ**:
  - **ચરબીમાં દ્રવ્ય (Fat-soluble)**: વિટામિન A, D, E, K. જેમ કે દૂધ, નટ્સ અને શાકભાજી અને ફળો
  - **પાણીમાં દ્રવ્ય (Water-soluble)**: B-ગ્રુપ અને વિટામિન C. જેમ કે ફળો, શાકભાજી અને અનાજ.
- **મિનરલ્સ**:(ખનિજ તત્વો)
  - **મુખ્ય મિનરલ્સ**: કેલ્શિયમ, પોટેશિયમ, સોડિયમ વગેરે હાડકાં, માસપેશી અને ચેત તંત્ર માટે જરૂરી છે.
  - **ટ્રેસ મિનરલ્સ**: ઝીંક, સિલેનિયમ વગેરે ઓછા પ્રમાણમાં જરૂર હોય છે, પરંતુ વિશિષ્ટ કાર્યો માટે જરૂરી છે.

3. અન્ય મહત્વપૂર્ણ પોષક તત્ત્વો

- **ફાઇબર**: પાચન તંત્રને આરોગ્યમય રાખે છે. જેમ કે અખ્ખુ અનાજ, ફળો અને શાકભાજી.
- **ફાઇટોન્યુટ્રિએન્ટ્સ**: છોડમાંથી મળતા પદાર્થો, જે રોગોથી રક્ષણ આપવા માટે મદદરૂપ છે.
- **એન્ટીઓક્સિડન્ટ્સ**: કોષોને નુકસાનથી બચાવે છે. જેમ કે ફળો, શાકભાજી અને નટ્સ.

શકિતવર્ધક, વિકાસ આપતા, ચમક આપતાં ખોરાક

શકિતવર્ધક ખોરાક

કાર્બોદિત પદાર્થો અને ચરબી
શકિતવર્ધક ખોરાક આપણાં રોજીંદા કાર્ય કરવા માટે શકિત આપે છે.

વિકાસ આપતાં ખોરાક

પ્રોટીન
વિકાસ આપતાં ખોરાક શારીરિક વૃધ્ધિ કરે છે.

ચમક આપતાં ખોરાક

વિટામિન્સ અને ખનીજ
ચમક આપતાં ખોરાક સ્વાસ્થ્ય અને સુખાકારી માટે હોય છે, તે સારી દ્રષ્ટિ, સ્વસ્થ ચામડી અને રોગ પ્રતિકારક શકિત આપે છે.

એસ.એન.એફ ફંડા
શકિતવર્ધક, વિકાસ આપતા, ચમક આપતાં ખોરાક લો અને અત્યંત શકિતશાળી બનો.

Source: Eat right India

કુપોષણ એટલે શું?

કુપોષણમાં અલ્પ પોષણ, સૂક્ષ્મ પોષકતત્વોની ઉણપ, મોટાપો, સ્થૂળતા, ખોરાક સંબંધિત બિનચેપી રોગોનો સમાવેશ થાય છે.

બાળકોમાાં કુપોષણ ઉંમર પ્રમાણે ઓછું વજન (Underweight),
ઉંમર પ્રમાણે ઓછી ઊંચાઈ (Stunting), ઠિંગણાપણું
ઊંચાઈ પ્રમાણે ઓછું વજન (Wasting), કુપોષણ
ઉંમર પ્રમાણે ઓછું બોડી માસ ઇન્ડેક્સ (બી.એમ.આઈ) પાતાળાપણું

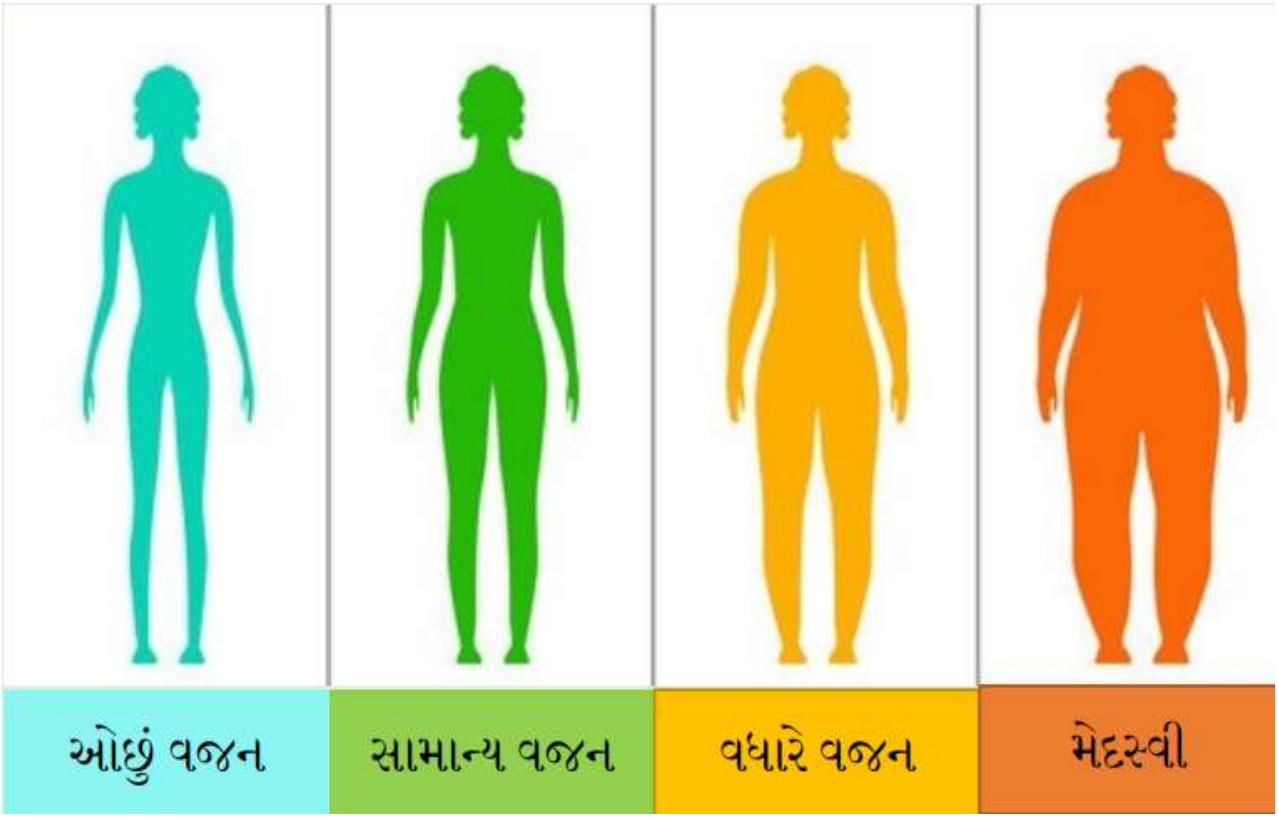
અતિ પોષણ (Overnutrition):
અતિપોષણ એ તે સ્થિતિ છે જ્યારે શરીર જરૂર કરતાં વધુ પોષક તત્વો લે છે, ખાસ કરીને કેલરી.
આનો પરિણામ વધુ વજન **(overweight)** અથવા મોટાપા **(obesity)**માં થાય છે, અને હૃદયરોગ, ડાયાબિટીસ, અને ઊંચું રક્તચાપ જેવા રોગોનો ખતરો વધી જાય છે.
BMI એ પોષણસ્તર માપવાનો સહેલો માપદંડ છે. **BMI** ના આધારે વ્યક્તિનું વજન ઓછું, સામાન્ય, વધારે, મેદસ્વી, અતિશય મેદસ્વી એમ જુદી-જુદી કક્ષામાં વર્ગીકૃત કરવામાં આવે છે.

બોડી માસ ઈન્ડેક્સ (BMI) ગણવાનીફોર્મુલા:

- બીએમઆઇ **(BMI) = વજન (કિલોગ્રામ) / ઊંચાઈ (મીટર) x ઊંચાઈ (મીટર)**

- એશિયા પેસિફિક સ્ટાન્ડર્ડ બીએમઆઇ પ્રમાણે પોષણ સ્થિતિ

બીએમઆઈ (kg/m²)	શ્રેણી
18.5 થી ઓછો	ઓછું વજન
18.5 – 22.9	તંદુરસ્ત
23 - 24.9	વધુ વજન
>25	સ્થૂળતા/મેદસ્વિતા



- માય થાળી


દૂધ /દહીં 300 મિલી
કઠોળ, ઈંડા અનેમાંસ(90gm)
ફળો(150 ગ્રામ)
300 ml
સુકા મેવા અને બીજ (20 ગ્રામ)
ચરબી અને તેલ (27 ગ્રામ)
શાકભાજી 350 ગ્રામ
અનાજ કઠોળ કંદમૂળ (270 ગ્રામ)

S

રિકમેન્ડેડ ડાયટરી અલાવન્સ પોષક તત્વો નું સુચિત પ્રમાણ

એનઆઈએન(NIN) દ્વારા વૈજુથ પ્રમાણે બધા પોષક તત્વો નું ઓરમાન સુચિત કરવા માં આયુછે (૨૦૨૪)

દૈનિક આહાર માં સૂચિત પોષક તત્વો નું પ્રમાણ, તંદુરસ્ત રેહવા માટે જરૂરી છે

વય જૂથ	વજન (kg)	એનર્જી	પ્રોટીન(g/dl)	ફાઇબર (g/dl)	કેલ્શિયમ(mg/dl)	આઇરન (mg/dl)	Vit b12(µg/d)	Vit C (µg/d)	Vit A (µg/d)	Vit D(µg/d)
પુખ્ત પુરુષો >18y	65	2710	54	40	100	19	2.2	80	1000	600
પુખ્ત સ્ત્રીઓ >18y	55	2130	46	30	1000	29	2.2	65	840	600
સગર્ભા સ્ત્રીઓ	55 +10	2580	55.5(2nd trimester 68(3rd trimester)		1000	27	2.45	80	900	600
સ્તનપાન કરાવતી સ્ત્રીઓ	55	2730	63		1200	23	3.2	115	950	600

❖ ફૂડ પિરામિડ:

ફૂડ ગાઈડ પિરામિડ એ પોષણની માર્ગદર્શિકા છે જેમાં તંદુરસ્ત રહેવા માટે ખોરાકના જૂથોને અને તેના પ્રમાણને અલગ-અલગ વિભાગમાં વિભાજિત કરવામાં આવ્યા છે. પિરામિડનો સૌથી નીચેનો ભાગ એવા ખોરાકનો બનેલો હોવો જોઈએ જે ખોરાક તમારા સ્વસ્થ આહારનો મૂજભૂત પાયો છે. તેનાથી વિપરીત તમારે જે ખોરાક ઓછી માત્રામાં કે ઓછી વખત ખાવો જોઈએ તે પિરામિડના નાના વિભાગોમાં દર્શાવામાં આવે છે. ભોજનના દરેક જુથ જુદા જુદા પોષક્તત્વો પૂરા પાડે છે અને કોઈ એક જુથ આપણા શરીરને જરૂરી તમામ પોષક્તત્વો પૂરા પડી શકતું

સ્ત્રોત: ભારતીઓ માટે ભોજનને લગતી માર્ગદર્શિકા, નેશનલ ઇન્સ્ટિટ્યૂટ ઓફ ન્યૂટ્રિશન , ૨૦૧૮-2020

તંદુરસ્ત અને રોગમુક્ત રેહવા રેહવા માટે દૈનિક આહાર માં નીચે જણાવેલ ખોરાક ના જુથો નો ઉપયોગ કરવો જોઈએ

સ્ત્રોત:NIN 2024

વય જૂથ	અનજ (g)	કઠોળ (g)	લીલા પાંદડાવાળા શાકભાજી (g)	શાક ભાજી (g)	કંદ અનેમૂળ (g)	ફળ (g)	નટ્સ (g)	દૂધ અને દૂધ ના પદાર્થો (g)	તેલ અને ચરબી (g)
પુખ્ત પુરુષો	320	105	100	200	100	100	40	300	30
પુખ્ત સ્ત્રીઓ	250	85	100	200	100	100	30	300	30
સગર્ભા સ્ત્રીઓ	260	85	150	200	100	150	40	400	35
સ્તનપાન કરાવતી સ્ત્રીઓ	260 250	85 85	150 150	200 200	100 100	150 150	40 40	400 400	35 35

❖ 2)સંતુલિત આહાર અને ખોરાકની વિવિધતા

❖ ખોરાક એટલે શું?

ખોરાક એ કોઈ પણ પૌષ્ટિક પદાર્થ છે જે ખાઈ અથવા પી શકાય અને એ ખાવાથી શરીરને કામ કરવાની શક્તિ અને પોષણ મળે છે અને આપણી વૃદ્ધિ થાય છે.

❖ ખોરાકના મુખ્ય ત્રણ કાર્યો શું છે?

1. ખોરાક શરીરને શારીરિક પ્રવૃત્તિઓ કરવા અને સ્વસ્થ અને સક્રિય રહેવા માટે ઊર્જા પ્રદાન કરે છે.
2. ખોરાક શરીરને વૃદ્ધિ માટે નવા પેશીઓ અને કોષો બનાવવામાં મદદ કરે છે.
3. ખોરાક શરીરના ક્ષતિગ્રસ્ત ભાગોને સુધારવા અને બદલવામાં મદદ કરે છે.

રોજિંદા જીવનમાં પોષકતત્વોની જરૂરિયાત પુરી કરવા ખોરાકના વિવિધ જૂથોનો સમાવેશ કરવો જરૂરી છે.

❖ જરૂરી ખોરાકના જૂથો:

1. અનાજ: અનાજ, સફેદ મૂળ અને કંદ, અને કેળા
2. કઠોળ: કઠોળ, વટાણા અને દાળ
3. તેલીબીયા અને બીજ: પ્રોટીન, આયર્ન અને અન્ય વિટામિન્સ અને ખનિજોનો સ્ત્રોત
4. ડેરી: પ્રોટીન, વિટામિન્સ અને કેલ્શિયમનો સારો સ્ત્રોત
5. માંસ, મરઘાં અને માછલી: પ્રોટીનનો સ્ત્રોત
6. ઈંડા: પ્રોટીનનો સ્ત્રોત
7. લીલા પાંદડાવાળા શાકભાજી: વિટામિન્સ, ખનિજો, કાર્બોહાઈડ્રેટ્સ અને ફાઈબરનો સ્ત્રોત
8. અન્ય વિટામિન A સમૃદ્ધ ફળો અને શાકભાજી: વિટામિન્સનો સ્ત્રોત
9. અન્ય શાકભાજી: વિટામિન્સ, ખનિજો, કાર્બોહાઈડ્રેટ્સ અને ફાઈબરનો સ્ત્રોત

10.અન્ય ફળો: વિટામિન્સનો સ્ત્રોત

❖ ખોરાકના જૂથો અને કાર્યો:

ખોરાકના જૂથો અને કાર્યો
૧. a. અનાજ: ઘઉં, ઘઉંનો લોટ, ચોખા, ચોખાના ટુકડા, મકાઈ, જવ, ઓટ્સ (જય), સુજી, વર્મિસેલી (સેવિયન), ફૂલેલા ચોખા વગેરે. b. મિલેટ્સ (બરછટ ધાન્ય): જુવાર, રાગી, કોદરી, સામો, બાજરી વગેરે. તે કાર્બોહાઈડ્રેટથી સમૃદ્ધ છે. કાર્બોહાઈડ્રેટ આપણને ઊર્જા અને ફાઇબર આપે છે. 
૨. દાળ અને કઠોળ: ચણા દાળ, ચણાનો લોટ (બેસન), મગની દાળ, કાળા ચણા, અડદની દાળ, તુવેર દાળ, ચણા (સફેદ/કાળી/લીલા ચણા), ફણગાવેલા કઠોળ, રાજમા, ચોડી, સોયાબીન વગેરે. તે પ્રોટીનથી સમૃદ્ધ છે. 
૩. શાકભાજી અને ફળો: આ જૂથ વિટામિસ અને ખનિજો પ્રદાન કરે છે. આપણા શરીરને સામાન્ય માટે વિટામિન અને ખનિજોની જરૂર છે. શરીરની કામગીરી અને ચેપ સામે લડવામાં મદદ કરે છે. a. શાકભાજી    લીલા પાંદડાવાળા શાકભાજી - પાલક, મેથીના પાન (મેથી), બથુઆ, કોથમીરના પાંદડા (ધનિયા), સરગવી, અડવી, તાંદળજો 

અન્ય શાકભાજી - ગાજર, ડુંગળી, રીંગણ, લેડી ફિંગર, કાકડી, ફૂલકોબી, ટામેટા, કેપ્સિકમ, કોબીજ વગેરે;

મૂળ અને કંદ - બટાકા, શક્કરટેટી, યમ, કોલોસિયા અને અન્ય મૂળ શાકભાજી;

b. ફળ - કેરી, જામફળ, પપૈયા, નારંગી, તરબૂચ, લીંબુ, દ્રાક્ષ, આમળા વગેરે.

૪. દૂધ અને પ્રાણી ઉત્પાદનો: આ જૂથમાં એવા ખોરાકનો સમાવેશ થાય છે જે સારી ગુણવત્તાવાળા પ્રોટીન પ્રદાન કરે છે. શરીરના પેશીઓ અને સ્નાયુઓ

પ્રોટીન બનાવવા અને સમારકામ માટે મહત્વપૂર્ણ છે.

a. દૂધ અને દૂધની બનાવટો - દૂધ, દહીં, ચીઝ, પનીર, વગેરે.

b. પ્રાણી ઉત્પાદનો - માંસ, ઈંડા, માછલી, ચિકન, યકૃત વગેરે.

૫. ચરબી/તેલ, ખાંડ અને સૂકા મેવા: આ જૂથમાં એવા ખોરાકનો સમાવેશ થાય છે જેમાં ઊર્જાનું પ્રમાણ વધારે હોય છે.

a. તેલ અને ચરબી - માખણ, ઘી, શાકભાજી રાંધવાનું તેલ જેમ કે મગફળીનું તેલ, સરસવનું તેલ, નાળિયેર તેલ વગેરે; તેલિબિયા-સફેદ ને કદ તલ,અળસી,પાપયા ના બીજ

b. ખાંડ - ખાંડ, ગોળ, મધ;

c. સૂકા મેવા - સીંગદાણા, બદામ, કાજુ, પિસ્તા, અખરોટ વગેરે.

❖ પોષકતત્વો એટલે શું?

- પોષક તત્વો એ ખોરાકમાં રાસાયણિક સંયોજનો છે જેનો ઉપયોગ શરીર દ્વારા યોગ્ય રીતે કાર્ય કરવા અને આરોગ્ય જાળવવા માટે થાય છે.

- પોષતત્વોની જરૂરિયાત પ્રમાણે બે પ્રકારના હોય છે:

૧. શરીર દ્વારા વધારે માત્રામાં જરૂરી છે- કાર્બોદિત પદાર્થો, પ્રોટીન, ચરબી

૨. શરીર દ્વારા ઓછી માત્રામાં જરૂરી છે- ખનીજદ્રવ્યો જેવા કે સોડિયમ પોટેશિયમ, કેલ્શિયમ, લોહતત્વ અને વિટામિન જેવા કે વિટામિન એ, વિટામિન બી કોમ્પ્લેક્સ, વિટામિન સી, વિટામિન ડી, વિટામિન ઈ, વિટામિન કે વગેરે.

❖ સંતુલિત આહાર એટલે શું?

સંતુલિત આહાર આરોગ્ય જાળવવા, વૃદ્ધિને વધારવા અને ઉર્જા પ્રદાન કરવા માટે યોગ્ય પ્રમાણમાં તમામ જરૂરી પોષક તત્વો પૂરા પાડે છે. તેમાં કાર્બોહાઈડ્રેટ્સ, પ્રોટીન, ચરબી, વિટામિન્સ, મિનરલ્સ, ફાઈબર અને પાણીનો સમાવેશ થાય છે.

સંતુલિત આહાર કેવી રીતે પ્રાપ્ત કરવું?
• વિવિધ તાજી, રંગબેરંગી અને સ્થાનિક રીતે ઉપલબ્ધ ફળો અને શાકભાજીનું સેવન કરો.
• કુદરતી ફાઈબરથી ભરપૂર હોવાથી આખા ફળો ખાઓ.
• મેંદાથી બનેલા ખોરાક સહિત શુદ્ધ અનાજના વપરાશને મર્યાદિત કરો.
• તમારા આહારમાં દરેક ખોરાક જૂથના ખોરાકનો સમાવેશ કરવાનો પ્રયાસ કરો.
• સરસવનું તેલ, મગફળીનું તેલ, સોયાબીન તેલ વગેરે વનસ્પતિ તેલ પસંદ કરો. રાંધવા/તળવા માટે. રોટેશનમાં વિવિધ તેલનો ઉપયોગ કરવો વધુ સારું છે.
• ખાદ્ય તેલો અને પ્રાણીઓના ખોરાકનો મધ્યમ ઉપયોગ સુનિશ્ચિત કરો.
• માખણ/ઘીનો ઉપયોગ મર્યાદિત કરો અને વનસ્પતી ટાળો અને ફરીથી ગરમ ચરબી અને તેલનો ઉપયોગ કરો.
• રોજ પુષ્કળ પાણી પીવો. ઠંડા પીણાં અને ફળોના રસને બદલે પાણી, છાશ, લસ્સી, નાળિયેર પાણી, લીંબુ પાણી/નિમ્બુ પાની, આમ પાન, કોકમ, સત્તુ વગેરે પીવો જોઈએ.

❖ ખોરાકમાં વિવિધતા શું છે?

- આહારની વિવિધતા એ ચોક્કસ સમયગાળા દરમિયાન ખાવામાં આવેલા ખોરાકના જૂથો દ્વારા નક્કી કરવામાં આવે છે. આથી આહારમાં વિવિધ પ્રકારના ખોરાક અને ખોરાકના જૂથો વધારવાથી જરૂરી પોષક તત્વો પૂરતા પ્રમાણમાં મળી રહે છે. ૫ અથવા ૫ થી વધાર ખોરાક ના જૂથ રોજ ખાવા થી ખોરાક માં વિવિધતા કહી સકાય

❖ પોષણયુક્ત ખોરાક અને ખોરાક માં વિવિધતા કેમ જરૂરી છે?

- સ્ત્રીએ સંતુલિત અને પૌષ્ટિક આહાર લેવો જોઈએ. આહારમાં અનાજ, કઠોળ, લીલા પાંદડાવાળા શાકભાજી, દૂધ, ઈંડા, માંસ અને માછલી સહિતના શાકભાજીનું મિશ્રણ હોવું જોઈએ. માંસ અને બદામ ખાસ કરીને એનિમિક મહિલાઓ માટે સારા છે.
- ચોખા, ઘઉં, રાગી, બાજરી, રોટલી, હલવો, ઈડલી, ડોસા, ઉપમા, પૌઆ વગેરે જેવા અનાજ ખાઓ. સફેદ બ્રેડ, બિસ્કિટ અને રિફાઈન્ડ લોટ (મેંદા)થી બનેલા અન્ય ખોરાકને ટાળો.
- મોસમી અને સ્થાનિક રીતે ઉપલબ્ધ ફળો અને શાકભાજી ઉદારતાથી ખાઓ.
- આહારમાં લીલા પાંદડાવાળા શાકભાજી (પાલક, મેથીના પાંદડા, વગેરે સ્ટાર્ચી શાકભાજી (શક્કરટેટી, યમ, કોલોસિયા વગેરે) અને અન્ય શાકભાજી (બીટરૂટ, રીંગણ, લેડી ફિંગર, ફૂલકોબી, કોબીજ, કઠોળ, ગાજર વગેરે) શામેલ કરો.
- સારી રીતે રાંધેલા ઈંડા, મરઘાં, માછલી વગેરે રાંધેલા માંસ નું સેવન કરો અને દૂધની બનાવટો જેમ કે દહીં, પનીર વગેરેનું મધ્યમ સેવન કરો.
- રોજ મગ, મસૂર, તુવેર, રાજમા વગેરે કઠોળનું સેવન કરો.
- રાંધણમાં સરસવનું તેલ, સોયાબીન તેલ, સૂર્યમુખીનું તેલ, મગફળીનું તેલ વગેરે ચરબીના શાકભાજીના સ્ત્રોતોનો ઉપયોગ કરો.
- દરરોજ પુષ્કળ પ્રવાહી પીવો.
- ઘઉં, ચોખા, તેલ, દૂધ અને મીઠું જેવા ફિલ્લેબંધ ખોરાકનું સેવન કરો.

❖ આયોડાઈઝ્ડ મીઠું:

આયોડાઈઝ્ડ મીઠું બાળક ના વિકાસ માંટે ખુબ જ જરૂરી છે. બાળક ના ખોરાક માં હંમેશા આયોડાઈઝ્ડ મીઠા નો જ ઉપયોગ કરવો જોઈએ.

આયોડાઈઝ્ડ મીઠાના નિયમિત ઉપયોગથી થતા ફાયદા:

- વ્યક્તિના શારીરિક તથા માનસિક વિકાસમાં સહાયરૂપ.
- શક્તિ અને બુદ્ધિવર્ધક.
- શરીરમાં લોહીની ઉણપ (આયર્નની ખામીથી થતા અનેમિયા) થી બચવામાં મદદરૂપ.
- આયોડીનની ઉણપથી થતા વિકાસલક્ષી વિલંબ અને ગલગંડ ના રોગથી બચાવ.
- આયોડીન સામાન્ય વૃદ્ધિ, થાઈરોઈડ અને મગજના વિકાસ માટે આવશ્યક છે.

ફોર્ટિફાઇડ ખોરાક જેવા કે તેલ,ચોખા ,ઘઉં નો લોટ અને દૂધ ખાવાથી પોષકતત્વો મળી શકે.

સામાન્ય રીતે, આપણે દિવસમાં 3 વખત ભોજન લઈએ છીએ: સવારનો નાસ્તો, બપોરનું ભોજન અને રાતનું ભોજન. આ બધામાંથી સવાર ના નાસ્તો ખૂબ જરૂરી છે.

❖ દરેક ભોજન નું મહત્વ:

સવારના નાસ્તાનું મહત્વ

- દરરોજ સવારે નાસ્તો કરવો જોઈએ.
- સવારનો નાસ્તો એ દિવસનો સૌથી મહત્વપૂર્ણ ભોજન છે કારણ કે આપણે રાત્રે કઈપણ ખાતા નથી અને સવાર આપણું પેટ ખાલી રહે છે.
- સવારે નાસ્તો ખાવાથી મગજને ફરીથી કામ કરવા માટે પોષણ મળે છે.
- જો આપણે સારી નાસ્તો નહીં કરીએ, તો આપણે થાક અનુભવીશું અને કામમાં ધ્યાન નહીં રહી શકે.
- આપણને ઉબકા અને માથાની દુખાવી સાથે થાક પણ અનુભવી શકીએ છીએ. સવારનો નાસ્તો આપણને વધુ ઊર્જા આપશે અને આપણી એકાગ્રતામાં સુધારો કરશે.


બીજા નાસ્તા નું મહત્વ-બપોર પહેલાના નાસ્તાનું મહત્વ

- સાવરનો નાસ્તો કર્યા પછી થોડો નાસ્તો લઈ શકાય છે. ચિપ્સ અથવા બિસ્કિટના પેકેટને બદલે એક ફળ અને થોડી મગફળી લો.
- તે ભોજન વચ્ચે ઉર્જામાં વધારો કરે છે અને લોહીમાં શર્કરાનું સ્તર જાળવી રાખે છે. તે પછીના ભોજનમાં માપસર ખોરાક ખાવામાં મદદ કરે છે.
- તે ફળો અને સૂકામેવામાંથી આવશ્યક વિટામિન્સ, ખનિજો અને પ્રોટીન પ્રદાન કરે છે.


બપોરના ભોજનનું મહત્વ

- બપોરનું ભોજન એ મહત્વનું ભોજન છે તે દિવસનું સૌથી મોટું ભોજન હોવું જોઈએ.
- તે શરીર અને મગજને દિવસભર યોગ્ય રીતે કામ કરતા રાખવા માટે ઊર્જા અને પોષક તત્વો પ્રદાન કરે છે.
- બપોરે જમવા આવામાં આવેલ સંતુલિત ભોજન જેમાં તમામ ૫ ખાધ જૂથો હોય છે તે સ્વાદિષ્ટ અને સ્વસ્થ પસંદગી છે. ઘરે રાંધેલ ખોરાક આપણને ખોરાક અને ઘટકોની ગુણવત્તા પર નિયંત્રણ આપે છે.

સાંજના નાસ્તાનું મહત્વ

- સાંજનો નાસ્તો કામથી આયા પાછી કાંતો કામ વચ્ચે લેવો જોઈએ.
- તે રાતના ભોજનનો સમય થાય ત્યાં સુધી ઊર્જા ટકાવી રાખવામાં મદદ કરે છે.
- સાંજના નાસ્તામાં ચણા, મગફળી, લેવ, એક ફળ વેવાની પ્રયાસ કરી અને ચિપ્સ અથવા નમકિન અથવા ભજીયા સાથે ચા પીવાનું ટાળો.
- તે દિવસના બીજા ભાગમાં આપણને ઊર્જાથી ભરપૂર અને તાજગીભર્યા રાખે છે.

રાતના ભોજનનું મહત્વ

- રાતનું ભોજન હળવું હોવું જોઈએ.
- રાતનું તંદુરસ્ત ભોજનથી સારી ઊંઘ આવે છે, બળતરા ઓછી થાય છે, તણાવ ઓછો કરે છે,પાચન સારું થાય છે, લોહીમાં શર્કરાનું પ્રમાણ જાળવે છે અને ચિંતા ઓછી કરે છે.

આટલું યાદ રાખો :

- **10** ખાદ્ય જૂથોમાંથી ઓછામાં ઓછા **5** ખાદ્ય જૂથો દરરોજ ખાવા જોઈએ.
- વિવિધ પ્રકારનો ખોરાક લેવા જોઈએ અને આયોડાઈઝ્ડ મીઠું ખાવું જોઈએ.
- દરેક ભોજન નું મહત્ત્વ જાણવું જરૂરી છે.

સ્વ સહાય જૂથના સભ્યો શું કરી શકે?

- સ્વ સહાય જૂથના દરેક સભ્ય સુધી **10** ખાદ્ય જૂથોની અને તેના કર્યોની જાણકારી આપવી.
- ખોરાકની વિવિધતા,ડબલ ફોર્ટિફાઈડ મીઠું અને દરેક ભોજન ના મહત્ત્વતની ચર્ચા કરવી.

3)

સૂક્ષ્મ પોષકતત્વો

સૂક્ષ્મ તત્વો એટલે શું?

સૂક્ષ્મ પોષકતત્વો એ વિટામિન અને ખનિજો છે જે શરીર ને ખુબ ઓછી માત્રા માં જરૂરી છે.

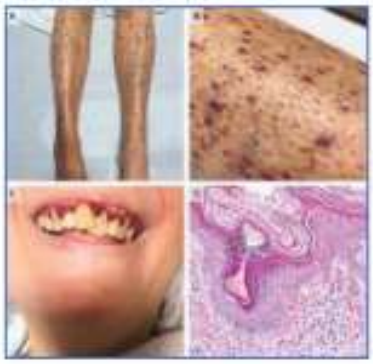
જો કે, શરીર ના સ્વાસ્થ્ય પર તેમની અસર નિર્ણાયક છે, અને તેમણે કોઇપણ ની ઉણપ ઘનભીર અને જીવલેણ પરિસ્તીથીઓ નું કારણ બનું શકે છે. તેઓ સામાન્ય વૃધુ અને વિકાસ માટે જરૂરી ઉત્સેચકો, હોર્મોન્સઅને અન્યઓદરથો ઉત્પન્ન કરવા માં શરીર ને શક્ષમ કરવા સહિત વિવિધ કાર્યો કેરે છે.

સૂક્ષ્મ પોષકતત્ત્વોની ઉણપ દેખીતી અને ખતરનાક આરોગ્ય સ્થિતિઓ નું કારણ બની શકે છે, પરંતુ

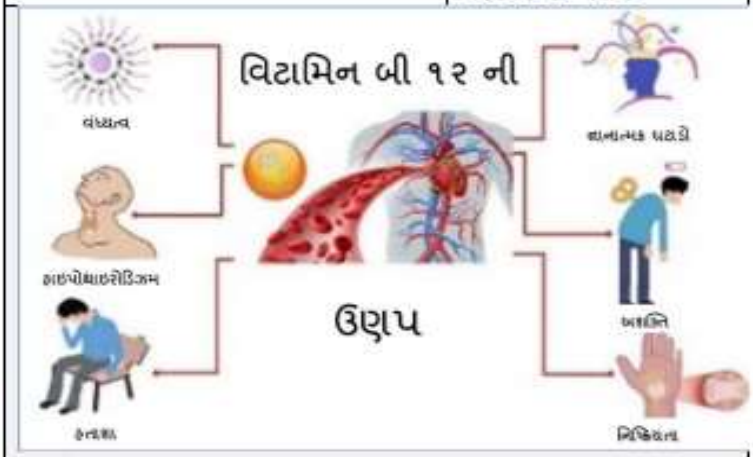
તે ઊર્જા સ્તર ,માનસિક સ્પષ્ટતા અને એકાંદર ક્ષમતા માં ઓછા તબીબી રીતે નોંધપત્ર ઘટાડો તરફ દોરી શકેછે. આનાથી શૈક્ષણિક પનરણામોમાાંઘટાડો, કામની ઉત્પાદકતામાાંઘટાડો અને અન્ય રોગો અને આરોગ્યની સ્થિતિ નું જોખમ વધી શકેછે.

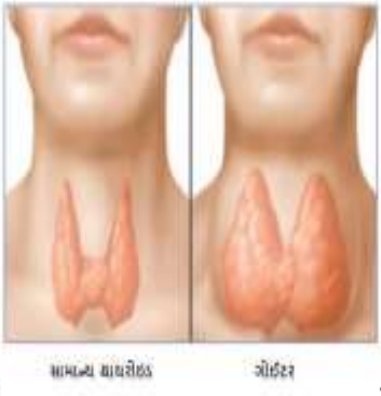
સૂક્ષ્મ તત્વો

વિટામિન	સ્ત્રોત	કાર્યો	ઉણપથી થતાં રોગો
વિટામિન એ	• લીલા (પાંદડાવાળા) શાકભાજી- પાલક • પીળા ફળ- કેરી, પપૈયું • લાલ રંગના શાકભાજી-ગાજર, શક્કરિયા અને લાલ કેપ્સિકમ    	તંદુરસ્ત આંખો, હાડકાં, પેશીઓ અને ત્વચા માટે	રાત્રે ઓછું દેખાવું- ઓછા પ્રકાશમાં જોવામાં સમસ્યા અને જો તેની સારવાર ન કરવામાં આવે તો તે અંધત્વ થઇ શકે છે. 

			
વિટામિન સી	• શાકભાજી જેમ કે પાલક, ટામેટાં • ખાટાં ફળો જેમ કે આમળા, જામફળ, સંતરા, લીંબુ, સ્ટ્રોબેરી • ફણગાવેલા કઠોળ    	કોલેજનનું નિર્માણ, આયર્નનું શોષણ, રોગપ્રતિકારક તંત્રની યોગ્ય કામગીરી, ઘામાં રૂઝ આવવા, હાડકાં અને દાંતની જાળવણીમાં જરૂરી છે.	સ્કર્વી- (પેઢાની આજુબાજુની ચામડીની નીચે, સાંધામાં રક્તસ્રાવ થવો, પેઢામાં સોજો અવવો અને પેઢા જાંબલી અને ગાદી જેવા થઈ જાય, વાળ શુષ્ક, બરડ અને ગુંઠાવાળા બને છે અને ત્વચા શુષ્ક, ખરબચડી અને ભીંગડાંવાળી થઈ જાય છે), એનિમિયા અને ચેપ 

વિટામિન	સ્ત્રોત	કાર્યો	ઉણપથી થતાં રોગો
વિટામિન ડી	• સૂર્યપ્રકાશ, ફોર્ટિફાઇડ ખોરાક, સૂકા મેવા, ઇંડા જરદી, કોડ લિવર તેલ 	કેલ્શિયમના શોષણમાં મદદ કરે છે અને હાડકાની તંદુરસ્તી માટે અને એકંદર રોગપ્રતિકારકતા જાળવવા માટે જરૂરી છે.	હાડકાંની વૃદ્ધિ ઘટે છે અને હાડકાંની નરમાઈમાં ઘટાળો થાય છે, હાડકાંના તૂટવાનું જોખમ વધે છે 

	  		
વિટામિન બી ૧૨	• ડેરી ઉત્પાદનો જેમ કે દહીં, દૂધ, ચીઝ • ઈંડા, માછલી, ચિકન અને માંસ     	ચેતાપ્રેષકોના નિર્માણ માટે, મગજ અને ચેતાના યોગ્ય વૃદ્ધિ, વિકાસ અને કાર્ય માટે, લાલ રક્તકણોની રચના, કોષ ચયાપચય અને ડીએનએના ઉત્પાદન માટે જરૂરી છે.	નબળાઇ, થાક, ચેતાને નુકસાન, હાથ અને પગમાં ઝણઝણાટની સંવેદના, માથાનો દુખાવો, ઝડપી ધબકારા અને શ્વાસ, ત્વચા ફિક્કી પડી જવી વગેરે 

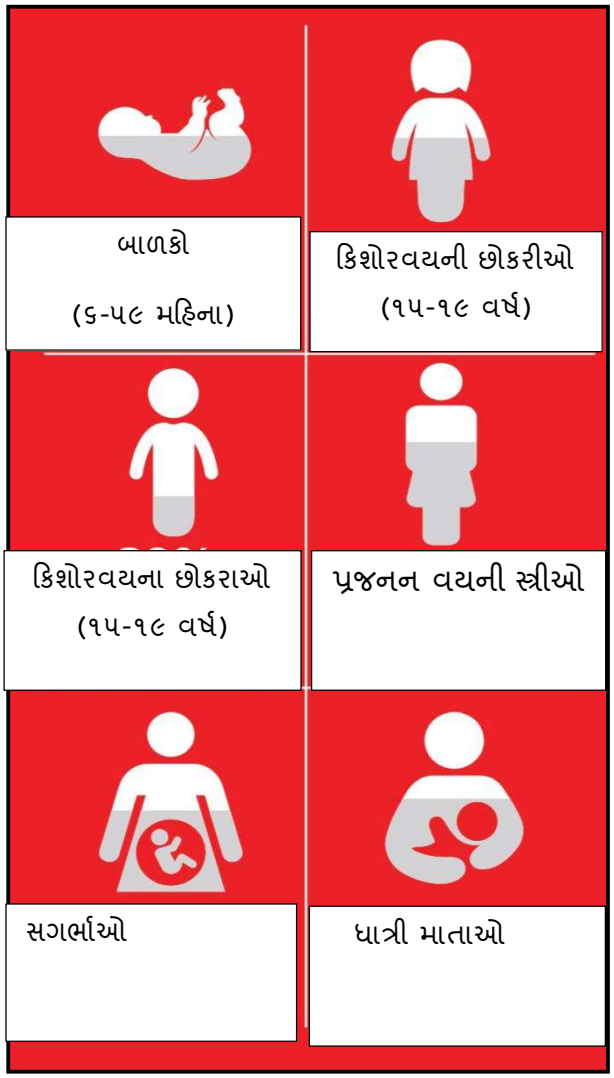
ખનીજક્ષાર	સ્રોત	કાર્યો	ઉણપથી થતાં રોગો
આયોડિન	• આયોડિનયુક્ત મીઠું • માછલી • ઈંડા 	થાઇરોઇડ હોર્મોન્સના સંશ્લેષણ અને મગજ અને ચેતાતંત્રના વિકાસ માટે જરૂરી	ગોઇટર (ગરદનમાં થાઇરોઇડ ગ્રંથિમાં સોજો, વજનમાં વધારો, થાક અને નબળાઇ, વાળ પાતળા, શુષ્ક ત્વચા, શીખવામાં અને યાદશક્તિમાં મુશ્કેલીઓ. 

- **4)એનિમિયા - પાંડુરોગ-લોહી ની ફિક્કાસ:**
- **એનિમિયા એટલે શું?**

શરીરમાં જ્યારે લાલ રક્તકણો ઓછા થાય છે, ત્યારે લોહીની ઊણપ સર્જાય છે. આ સમસ્યાને એનિમિયા કહેવામાં આવે છે. લોહીમાં હિમોગ્લોબિનની ઊણપ થવા થી લોહી ફિક્કુ પડે છે, નબળાઈ વર્તાય છે. એનિમિયાનો યોગ્ય ઈલાજ ન કરાવવા પર ગંભીર બીમારીઓ થઈ શકે છે.

- એનિમિયા એક એવી સ્થિતિ છે જેમાં લોહીના લાલ રક્તકણોની સંખ્યા અથવા તેમની ઓક્સિજન-વહન કરવાની ક્ષમતા, શરીરની શારીરિક જરૂરિયાતોને પહોંચી વળવા માટે અપર્યાપ્ત થઈ જાય છે.
- સાદી ભાષામાં એમ પણ કહેવાય કે લોહીમાં ફિક્કાશ આવી જાય છે.

❖ એનિમિયા કોણે-કોણે થઈ શકે?



સ્ત્રોત: નેશનલ આયરન પ્લસ ઈનિશિયેટિવ (NIPI)

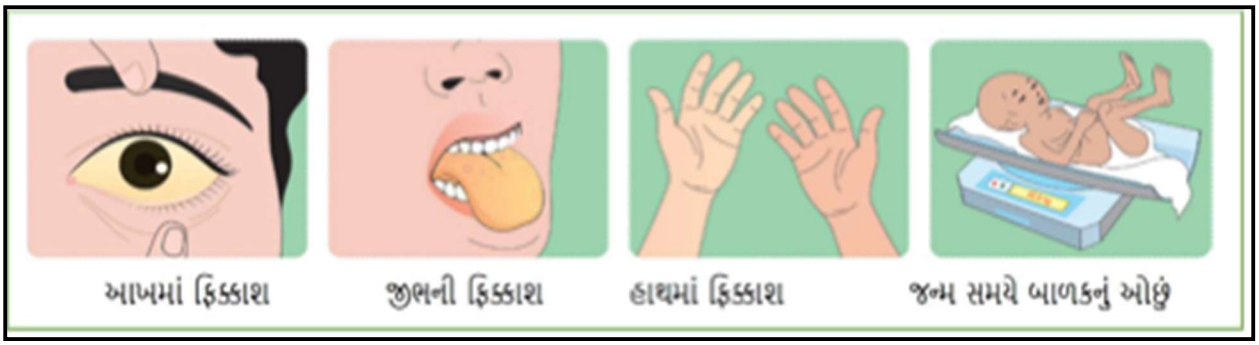
❖ એનિમિયા થવાના કારણો:

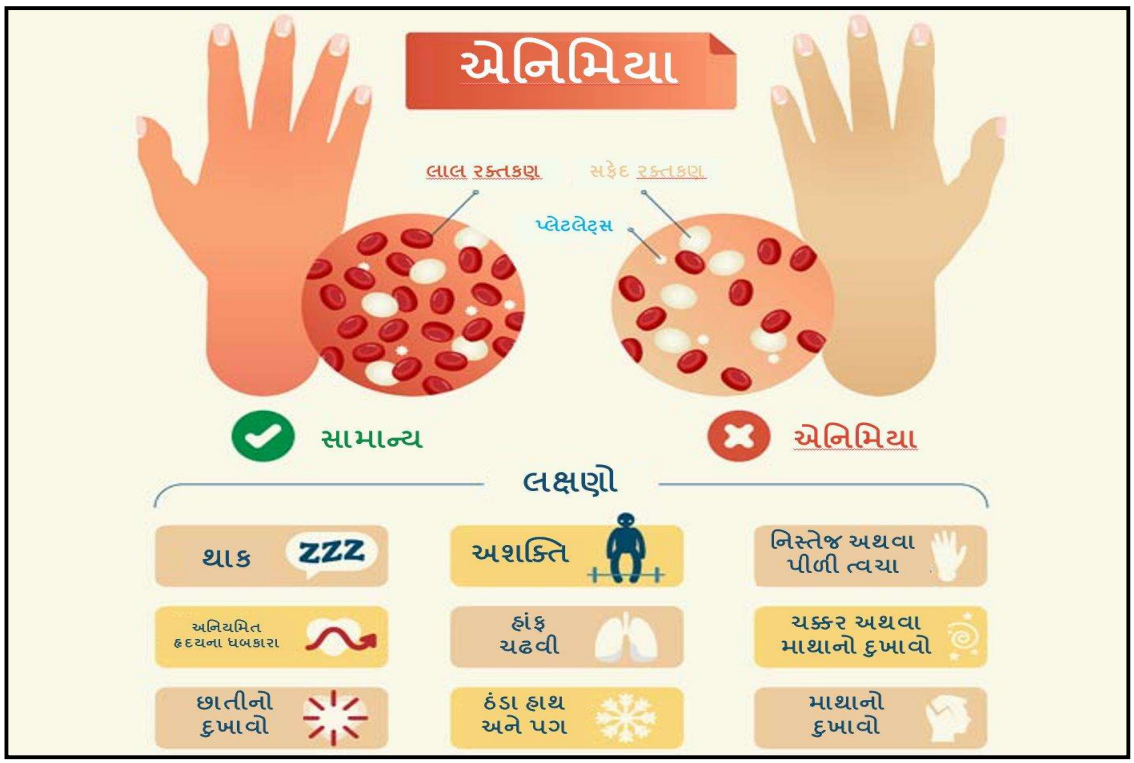
- રોજિંદા આહારમાં લોહતત્વ યુક્ત ખોરાકની અપૂરતી માત્રા
- લોહતત્વ યુક્ત ખોરાક સાથે ચા, કોફી પીવી

- માસિકના દરમિયાન, પ્રસવમાં કે કોઈ ઇજાના કારણે વધારે માત્રામાં લોહી વહી જવું
- વારંવાર મલેરિયા થવાથી - હિમોગ્લોબિનના સ્તરમાાં ઘટાડો થાય છે
- કૃમિ હોવાથી

❖ **એનિમિયાના લક્ષણો:**

- આંખો, જીભ અને નખમાં ફિક્કાશ
- થાક લાગવો
- ભૂખ ન લાગવી
- શરીરમાં અશક્તિ લાગવી
- હાંફ ચઢવો
- ચક્કર આવવા
- નખ બરડ, ફીકા અને ચમચી જેવા થઈ જવા-અતિ ગંબીર એનિમિયાની પરિસ્થિતિમાં
- ઝડપી અને અનિયમિત હૃદયના ધબકારા





❖ એનિમિયાના આડ અસરો:

- કામ કરવાની ક્ષમતામાં ઘટાડો
- ભણતરમાં નબળો દેખાવ
- રોજિંદા ઘરકામ કરવામાં ખૂબ અશક્તિ લાગવી
- વારંવાર માંદા પડવું

- કિશોરીઓમાં અનિયમિત માસિક આવર્તન
- ભૂખ ઓછી લાગવી
- રોગ પ્રતિકારક શક્તિમાં ઘટાડો
- કાર્યશક્તિમાં ઘટાડો

❖ **લોહતત્વ ખોરાક માં ક્યાંથી મળે છે?**

- લીલા પાંદડાવાડા શાકભાજી- મેથી, પાલક, મૂળાના પાન, સરગવાના પાન, અરબીના પાન (પાતરા), તાંદળજો, વગેરે
- કઠોળ- મગ, ચણા, મઠ, ચોળા, વાલ, વગેરે
- મિલેટ્સ- બાજરી, જોવર, રાગી
- ખજૂર
- બીટ
- ઈંડા, માંસ, મચ્છી

એનિમિયા કેવી રીતે અટકાવી શકાય/નિવારણ પગલા:

અનિમિયા (પાંડુરોગ) નિવારણના પગલાં
અનેમિયાથી બચવા માટે લોહતત્વથી ભરપૂર ખોરાકનો ભોજનમાં નિયમિત રીતે સમાવેશ કરવો • લીલા પાંદડાવાળા શાકભાજી - પાલક, મેથી, સરગવો • માંસાહારી ભોજન -ઈંડા, માંસ, માછલી

- ઘઉં, જુવાર, બાજરી, નાગલી, અડદ, ફણગાવેલા કઠોળ, કાળા ચણા, મગફળી, તલ, ખજૂર, સુકોમેવો વગેરે
- લોહતત્વથી ફોર્ટિફાઇડ ખોરાક ખાવો

વિટામિન સી થી ભરપૂર ખાદ્ય પદાર્થોનો ઉપયોગ કરવો

- વિટામિન સી યુક્ત ખાદ્ય પદાર્થો શરીરમાં લોહતત્વનું શોષણ કરવામાં સહાયરૂપ બને છે.
- રોજિંદા ખોરાકમાંથી લોહતત્વનું શોષણ વધારવા માટે ભોજનમાં આંબળા, જમફળ, ટામેટાં સંતરા, લીંબુ, વગેરે નો સેવન કરવો જોઈએ.

લોહતત્વયુક્ત ખોરાક સાથે ચા-કોફી નો ઉપયોગ ટાળો

- લોહતત્વયુક્ત ખોરાક કે લોહતત્વની ગોળી લીધાના એક

કલાક પહેલા કે એક કલાક સુધી ચા કે કોફી પીવાનું

ટાળો કારણ કે ચા- કોફી લોહતત્વ પૂરેપૂરું શોષણ થવા દેતું નથી.

- તેમજ કેલ્શિયમની ગોળી અને દૂધ પણ લોહતત્વના શોષણને અટકાવે છે તેથી લોહતત્વની ગોળી સાથે લેવા જોઈએ નહીં.

રોજિંદા ખોરાકમાંથી હંમેશા પુરતું લોહતત્વ મળી શકતું નથી તે માટે લોહતત્વની ગોળી લેવી જોઈએ.

લોહતત્વની ગોળી

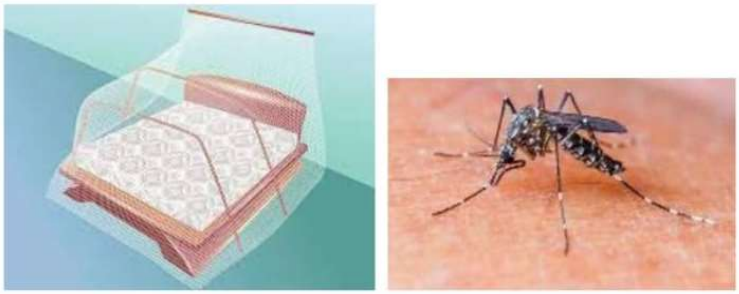
દર ૬ મહિને કૃમિનાશક ગોળી ખાવી

- કૃમિના કારણે યોગ્ય પોષકતત્વો નું શોષણ યોગ્ય રીતે થઈ ધર્મનુ નથી જેથી અનેમિયા તથા અન્ય સૂક્ષ્મ પોષકતત્વોની ઉણપ જેવા રોગો થઈ શકે છે.
- કૃમિ પગના તળિયેથી શરીરમાં પ્રવેશ કરે છે એટલે પગમાં હંમેશા ચપ્પલ કે બુટ પહેરવાની ટેવ પાડવી
- અનીમિયાથી બચવા કૃમિથી બચવું ખૂબ જરૂરી છે. ૬ મહિનામાં એકવાર કૃમિની દવા આંગણવાડી પરથી આપવામાં આવે છે.

કૃમિનાશક ગોળી

રાત્રે ઊંઘતા સમયે મચ્છરથી બચવા મચ્છરદાનીનો ઉપયોગ કરો

- ચેપી મચ્છર કરડવાથી લાલ રક્ત કોશિકાઓને નુકશાન થઈ શકે છે.
- આ પ્રક્રિયા શરીરમાં લાલ રક્તકણોની સંખ્યામાં ઘટાડો કરે છે અને ગંભીર એનિમિયામાં પરિણમી શકે છે.



મચ્છરથી બચવા માટે મચ્છરદાનીનો ઉપયોગ કરો

આટલું યાદ રાખો :

- દૈનિક આહારમાં લોહતત્વ યુક્ત ખોરાક જેમકે લીલા પાંદડા વાડા શાકભાજી, ખજૂર, અસાડિયો, તલ, બાજરી, વગેરે ખાવાથી એનિમિયા થઇ બચી શકાય છે.

બિન-સંક્રમિત રોગોના મુખ્ય પ્રકારો:

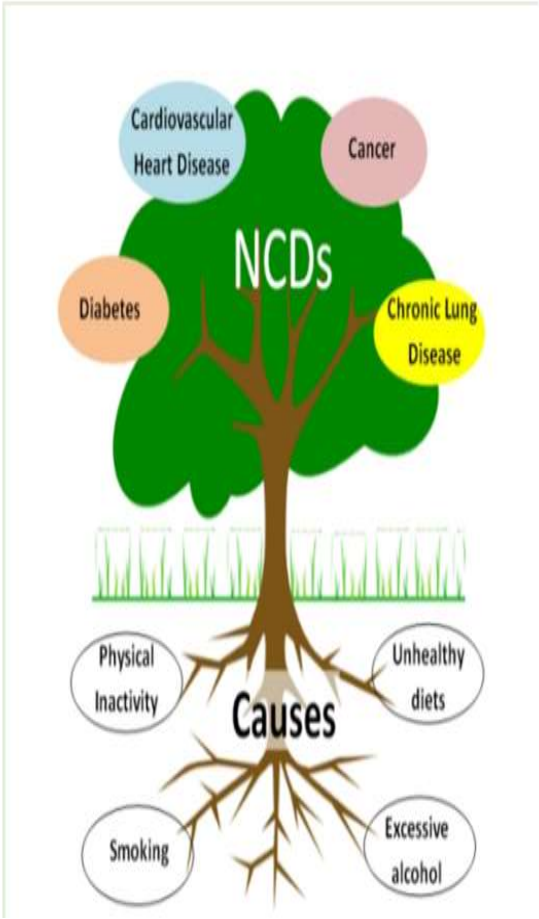
- હૃદય રોગો
- શ્વાસના રોગો
- ડાયાબિટીસ
- કેન્સર

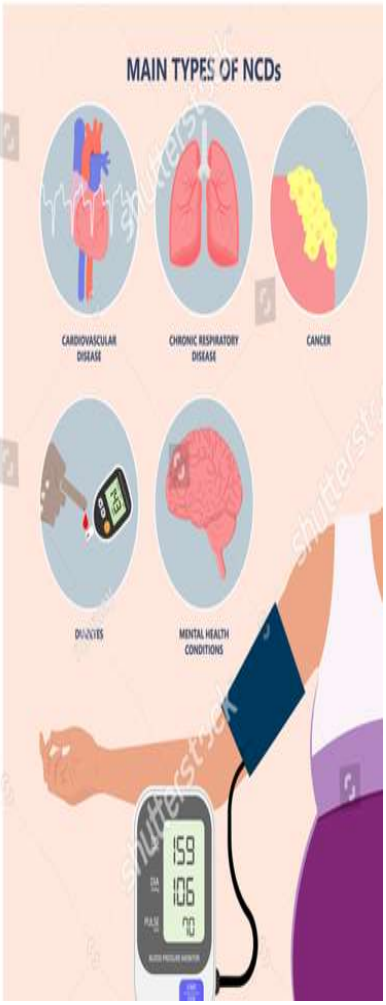
બિન સંક્રમિત રોગો :

બિન-સંક્રમિત રોગો (એનસીડી), જેને ક્રોનિક રોગો તરીકે પણ ઓળખવામાં આવે છે, તે એવી પરિસ્થિતિઓ છે જે એક વ્યક્તિથી બીજા વ્યક્તિમાં ફેલાતા નથી. બિન-સંક્રમિત રોગો (એનસીડી) લાંબા સમયગાળાના હોય છે અને તે આનુવંશિક, શારીરિક, પર્યાવરણીય અને વર્તણૂકીય પરિબળોના સંયોજનનું પરિણામ છે.

બિન-સંક્રમિત રોગ વિશેની સૌથી ગંભીર ચિંતા એ છે કે તેઓ તેમના જીવનનાં ઉત્પાદક વર્ષોમાં લોકોને અસર કરે છે. તેઓ " અકાળ મૃત્યુ" ને પણ વધારો આપે છે - એટલે કે સરેરાશ આયુષ્ય પહેલાં મૃત્યુ થાય છે.

બિન સંક્રમિત રોગો ના જોખમી પરિબળો કયા છે?





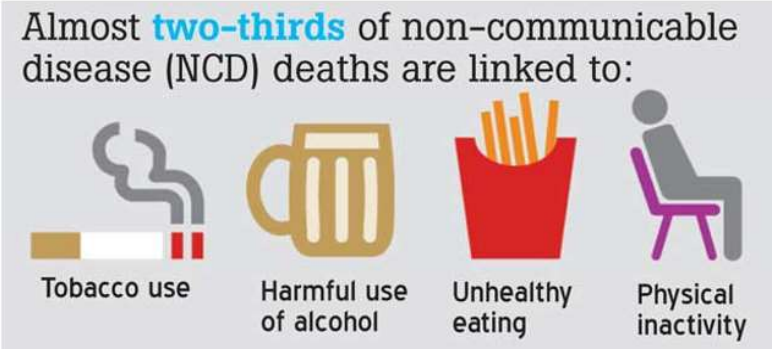
જોખમી પરિબળો એવા પરિબળો છે જે કોઈ રોગ થવાની આપણી સંભાવનામાં વધારો કરે છે.

જોખમી પરિબળો ૨ પ્રકાર ના હોય છે:

- **ફેરફાર ન કરી શકાય તેવા જોખમી પરિબળો**: આ જોખમી પરિબળો વ્યક્તિ માટે જન્મજાત હોય છે જેમ કે પારિવારિક ઈતિહાસ, લિંગ અને ઉંમર જે બદલી શકાતા નથી.
- **ફેરફાર કરી શકાય તેવા જોખમી પરિબળો**: આ પરિબળો આપણે જે રીતે જીવીએ છીએ તે રીતે આપણે જે પસંદગીઓ કરીએ છીએ તેની સાથે જોડાયેલા છે અને ક્રિયા સાથે ફેરફારો થઈ શકે છે.

ફેરફાર કરી શકાય તેવા જોખમી પરિબળો નો ઉમેરો:

- તમાકુ અને આલ્કોહોલનો ઉપયોગ
- અસ્વસ્થ આહાર
- ફળ અને શાકભાજી નો ઓછો ઉપયોગ
- વધારે માત્રા માં મીઠું, સાકર અને ચરબી વાળા ખોરાક નો ઉપયોગ
- શારીરિક નિષ્ક્રિયતા
- સ્થૂળતા
- તણાવ



કેવી રીતે જાણવું કે કોઇ વ્યક્તિ નું વજન વધારે છે કે તે મેદસ્વી છે?

બોડી માસ ઈન્ડેક્સ (BMI) એ એક સ્ક્રીનિંગ ટૂલ છે જે સૂચવી શકે છે કે વ્યક્તિનું વજન ઓછું છે કે પછી જો વ્યક્તિનું વજન સ્વસ્થ હોય, વજન વધારે હોય અથવા મેદસ્વી હોય.

વધુ વજન અથવા મેદસ્વી હોવાને કારણે ડાયાબિટીસ, હાઈ બ્લડ પ્રેશર અને હૃદય રોગો જેવી અનેક પ્રકારની અસ્વસ્થ સ્થિતિ સર્જાઈ શકે છે.

બીએમઆઈની(BMI) ગણતરી કરવા વ્યક્તિની ઊંચાઈ અને શરીરનું વજન માપવું અને આપેલ ફોર્મ્યુલા લાગુ કરવો;

BMI = વજન (કિલોગ્રામ)/ઉંચાઈ (મીટર)^2

નીચેના કોષ્ટકમાં પુખ્ત વયના લોકો માટે બીએમઆઈ (BMI) રેન્જ સાથે એશિયન સ્ટાન્ડર્ડ વજનની સ્થિતિ શ્રેણીઓ બતાવવામાં આવી છે.

BMI	Weight Status
<૧૮.૫	ઓછું વજન
૧૮.૫-૨૨.૯	સામાન્ય વજન
૨૩-૨૭.૫	વધારે વજન
≥૨૭.૫	મેદસ્વી

સંતુલિત આહાર કેવી રીતે પ્રાપ્ત કરી શકાય?

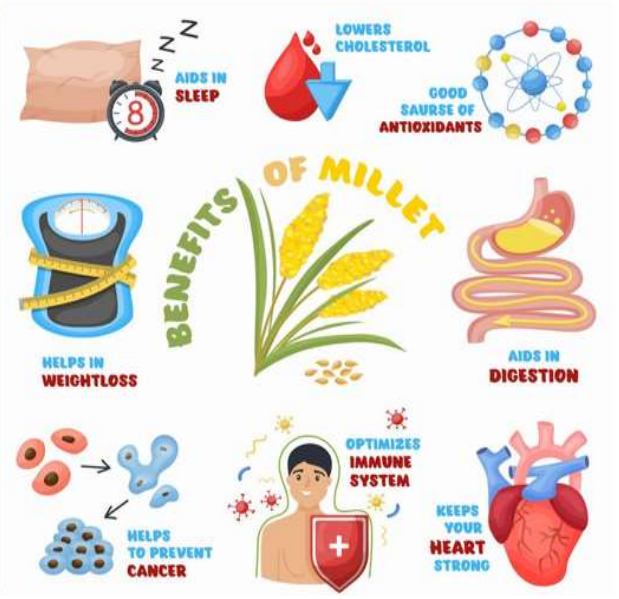
- વિવિધ પ્રકારના તાજા, રંગીન અને સ્થાનિક રીતે ઉપલબ્ધ ફળો અને શાકભાજીનું સેવન કરો.
- આખા અનાજ, અનાજ અને કઠોળ (બાહ્ય આવરણ સાથે) અને તેમના ઉત્પાદનો ખાઓ.
- આખા ફળો ખાઓ કારણ કે તે કુદરતી ફાઇબરથી ભરપૂર હોય છે.
- મેદા સાથે બનાવવામાં આવેલા ખોરાક સહિત શુદ્ધ અનાજના વપરાશને મર્યાદિત કરો.
- તમારા આહારમાં દરેક ખાદ્ય જૂથના ખોરાકને શામેલ કરવાનો પ્રયાસ કરો..
- વનસ્પતિ તેલ જેવા કે સરસવનું તેલ, મગફળીનું તેલ, સોયાબીન તેલ વગેરે પસંદ કરો. રાંધવા/તળવા માટે. પરિભ્રમણમાં વિવિધ તેલનો ઉપયોગ કરવો વધુ સારું છે.
- ખાદ્યતેલો અને પ્રાણીઓના ખોરાકનો મધ્યમ ઉપયોગ સુનિશ્ચિત કરો.
- માખણ/ઘીનો ઉપયોગ મર્યાદિત કરો અને વનસ્પતિ ટાળો અને ફરીથી ગરમ ચરબી અને તેલનો ઉપયોગ કરો.
- દરરોજ પુષ્કળ પાણી પીવો. ઠંડા પીણાં અને ફળોના રસને બદલે પાણી, છાશ, લસ્સી, નાળિયેર પાણી, લીંબુ પાણી/ નિમ્બુ પાની, આમ પાન, કોકમ, સટ્ટુ વગેરે પીણાં નું સેવન કરવું જોઈએ.

બિન સંક્રમિત રોગો માં મિલેટની ભૂમિકા શું છે?

મીલેટ ગ્લુટેન મુક્ત, ખૂબ પૌષ્ટિક અને ફાઇબરથી ભરપૂર હોય છે. બાજરી હૃદય રોગને રોકવામાં મદદ કરે છે. તેમાં કેલ્શિયમ, આયર્ન, ફોસ્ફરસ વગેરે સહિત સૂક્ષ્મ પોષક તત્વો ભરપૂર માત્રામાં હોય છે. તેમાં ગ્લાસેમિક ઈન્ડેક્સ (GI)નું પ્રમાણ ઓછું હોય છે અને બ્લડ સુગરમાં મોટો વધારો કરતા નથી. બાજરી આદર્શ રીતે આપણા દૈનિક આહારનો અભિન્ન ભાગ હોવો જોઈએ.

વિવિધ મીલેટની પોષકતત્વો ની માત્રા (પ્રતિ 100 ગ્રામ):

મીલેટ	એનેર્જી (કિલોકેલોરી)	કાર્બોહાઇડ્રેટ (ગ્રામ)	પ્રોટીન (ગ્રામ)	ફેટ (ગ્રામ)	ફાઇબર (ગ્રામ)	કેલ્શિયમ (મિલીગ્રામ)	ફોસ્ફરસ (મિલીગ્રામ)	આયર્ન (મિલીગ્રામ)
જોવારી	૩૪૯	૭૨.૬	૧૦.૪	૧.૯	૧.૬	૨૫	૨૨૨	૪.૧
બાજરી	૩૬૧	૬૭.૫	૧૧.૬	૫.૦	૧.૨	૪૨	૨૯૬	૮.૦
કોધરી	૩૦૯	૬૫.૯	૮.૩	૧.૪	૯.૦	૨૭	૧૮૮	૦.૫
સામો	૩૦૭	૬૫.૫	૬.૨	૨.૨	૯.૮	૨૦	૨૮૦	૫.૦



કેન્સર

કેન્સર નિવારક પગલા:

- ધૂમ્રપાન, તમાકુની બનાવટો અને આલ્કોહોલના સેવનથી દુર રહો.
- ખોરાકની આરોગ્યપ્રદ પદ્ધતિ અનુસરો.
- ઋતુ પ્રમાણેનાં શાકભાજી અને ફળો પુષ્કળ પ્રમાણમાં ખાઓ.
- વધુ રેસાયુકત ખોરાક લો.
- ચરબીવાળા ખોરાક લેવાનું ટાળો.
- નિયમિત કસરત કરો.

ચેતવણીરૂપ ચિહ્નો

- આંતરડાં અથવા બ્લેડર (મૂત્રાશય) ની કામગીરીમાં ફેરફાર.
- રૂઝાતો ન હોય તેવો ઘા / ચાંદા.
- અસામાન્ય રકતસ્રાવ (બ્લીડીંગ) થવું અથવા પ્રવાહી નીકળવું.
- સ્તન અથવા બીજે ચામડીમાં ગાઠો અથવા સોજો.
- અપચો અથવા ખોરાક/પાણી ગળે ઉતારવામાં મુશ્કેલી.
- મસા અથવા તલમાં દેખીતો ફેરફાર.
- સખત ઉધરસ અથવા અવાજમાં ઘોઘરાપણું.

ઉપરનામાંથી કોઈપણ લક્ષણો જણાય, તો ડોકટરની સલાહ લેવી.
પારંભિક તબકકામાં કેન્સરની સારવાર થી કેન્સર મટી શકે છે.

ધ ઈટ રાઈટ મુવમેટ

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આજથી થોડું ઓછું તેલ, ખાંડ અને મીઠાનો ઓછો ઉપયોગ

તમારા રોજીંદા આહારમાં મીઠું, ખાંડ અને ચરબીનું પ્રમાણ ઘટાડો અને સ્થૂળતા, લોહીનું ઉચું દબાણ, ડાયાબિટીસ, હૃદય રોગ અને બીજા બીન ચેપી રોગોનું જોખમ ઘટાડો.

- **ઘટાડો** – ધીમે ધીમે તમારા રોજીંદા આહારમાં મીઠું, ખાંડ અને તેલનું પ્રમાણ
- **નિયંત્રણ કરો** – દર મહિને મીઠું, ખાંડ અને તેલ ઓછું ખરીદો / માપમાં વાપરો
- **બદલવું** – સ્વાસ્થ્ય વિકલ્પો ખાંડને બદલે ફળો, વનસ્પતિજન્ય થી ને બદલે વનસ્પતિજન્ય તેલ
- **માપદંડ રાખો** – નાની ચમચીથી મીઠું, ખાંડ અને તેલને ખોરાકમાં નાખવાં
- **ઓછું કરો** – અથાણાં, ખારા નાસ્તાં, સોસ, જામ, ઠંડા પીણા, મીઠાઈઓ, તળેલાં આહાર
- **ટાળવું** – -તેલને વારંવાર ગરમ કરવું અને વાપરવું -કુચુંબર, કાપેલાં ફળો, દહીંમાં મીઠું અને ખાંડ નાંખવાં -રોટલી અને ભાત બનાવતી વખતે મીઠું નાંખવું -શુધ્ધ ખાંડ વાપરવી

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- ફન્કશનલ ફૂડસ માં વિટામિન્સ, પ્રોબાયોટિક્સ, એન્ટિઓક્સિડન્ટ્સ, ફાઇબર્સ વગેરે જેવા સક્રિય સંયોજનો હોય છે જે સ્વાસ્થ્યને ટેકો આપે છે અને વિવિધ રોગોને રોકવામાં મદદ કરે છે.
- સંતુલિત આહારના દરેક ખાદ્ય જૂથમાંથી, દરરોજ, એનસીડીનું જોખમ ઘટાડવા માટે ફન્કશનલ ફૂડસ નો ઉમેરો કરવા નિ સલાહ આપવા માં આવે છે.

આહાર ઔજ ઔષધ		
હર્બ/ સ્પાસ્સ	ગુજરાતી નામ	સ્વાસ્થ્ય લાભ
Fenugreek seeds	મેથી	બ્લડ શુગર સ્તર સુધારે છે, કોલેસ્ટરોલ ઘટાડે છે, બળતરા વિરોધી અસરો કરે છે અને ભૂખને નિયંત્રિત કરે છે.
Garlic	લસન	રક્તવાહિનીઓને બરાબર રાખે છે, કોલેસ્ટરોલ અને ટ્રાઇગ્લિસરાઇડના સ્તરને ઘટાડવામાં મદદ કરે છે.
Turmeric	હળદળ	બળતરા ઘટાડવામાં અને હૃદયના સ્વાસ્થ્યને સુધારવામાં મદદ કરે છે.
Cumin	જીરું	પાચનમાં મદદ કરે છે, બ્લડ શુગર સ્તર ઘટાડે છે, ઇન્સ્યુલિનની સંવેદનશીલતા વધારે છે, હૃદયના રોગો સામે રક્ષણ આપે છે.
Coriander	ધાણા	બ્લડ પ્રેશર, બ્લડ શુગરનું સ્તર અને કોલેસ્ટરોલનું સ્તર ઘટાડવામાં મદદ કરે છે.
Cinnamon	તજ	કોલેસ્ટરોલનું સ્તર અને બ્લડ શુગરનું સ્તર ઘટાડવામાં મદદ કરે છે.
Cardamom	એલૈચી	બ્લડ પ્રેશર ને ઓછું કરે છે, શ્વાસ સુધારે છે અને પેટના અલ્સરને મટાડવામાં મદદ કરે છે.
Basil	તુલસી	કેન્સર સામે રક્ષણ આપે છે, બ્લડ શુગરના સ્તરને નિયંત્રિત કરે છે, તમારા કોલેસ્ટરોલ અને ટ્રાઇગ્લિસરાઇડને ઘટાડે છે.
Ashwagandha	અશ્વગંધા	બ્લડ શુગરનું સ્તર ઘટાડે છે, તાણાવનું સંચાલન કરે છે, ચિંતા ઘટાડે છે.
Cloves	લવિંગ	એન્ટિઓક્સિડન્ટ્સનું પ્રમાણ વધારે છે, કેન્સર સામે રક્ષણ આપે છે, બ્લડ શુગરને નિયંત્રિત કરવામાં મદદ કરે છે અને હાડકાના સારા સ્વાસ્થ્યને પ્રોત્સાહન આપે છે.
Dry Ginger	સુંઠ	વજન ઘટાડવા માં અને અપચો રોકવામાં મદદ કરે છે, બ્લડ શુગરનું સ્તર અને કોલેસ્ટરોલ ઘટાડે છે
Flax Seeds	અળસી	પાચનસુધારે છે, હૃદયરોગ, ડાયાબિટીસ અને કેન્સરનું જોખમ ઘટાડે છે.
Garden Cress Seeds	અસાળીયો	આયર્ન અને ફાઇબરથી ભરપૂર, વજન ઘટાડવામાં મદદ કરે છે, બ્લડ શુગરનું સ્તર ઘટાડે છે અને રોગપ્રતિકારક શક્તિ વધારે છે.
Chia Seeds	ચિયા બીજ	એન્ટીઓક્સિડન્ટો અને ફાઇબરથી ભરપૂર, બ્લડ શુગરનું સ્તર અને હૃદયના રોગોનું જોખમ ઘટાડે છે, વજન ઘટાડવામાં મદદ કરે છે અને હાડકાના સ્વાસ્થ્ય માટે સારું છે.

6) જંક ફૂડ ખાવાની આડઅસર:

જંક ફૂડ એટલે શું?

1)જંક ફૂડ એટલે એવા ખોરાક જે સ્વાસ્થ્ય માટે હાનિકારક હોય અને તેમાં પોષક તત્વો ઓછા હોય. આ પ્રકારના ખોરાકમાં સામાન્ય રીતે વધારે ચરબી, ખાંડ, મીઠું અને કલરી હોય છે, પરંતુ પોષક તત્વ જેવી કે વિટામિન, ખનિજ અને પ્રોટીન ઓછા હોય છે. ઉદાહરણ તરીકે, ચિપ્સ, કંદ, નૂડલ્સ, સોડા, અને ફાસ્ટ ફૂડને જંક ફૂડ ગણવામાં આવે છે.

તો જન્કફૂડ શું છે? 'જન્ક' શબ્દ નો અર્થ નકામું થાઈ છે. અને તે વાત તો ભાડા જ લોકો ને ખબર છે કે જન્ક ફૂડ ની અંદર ન્યુટ્રિશનલ લાભો કોઈ જ પ્રકાર ના હોતા નથી જેના કારણે તે આપણા સ્વાસ્થ્ય માટે અનહેલ્ધી છે. અને તેના કારણે આપણ ને ઘન બધા સ્વસ્થ્ય ને લગતા રોગો થઇ શકે છે પછી ભલે તમે તેને ક્યારેક જ ખાતા હોવ કે રોજ ખાતા હોવ.

2)જંક ફૂડ ખાવાની આડઅસર:

શરીર પર અને માનસિક સ્વાસ્થ્ય પર

વધુ પ્રમાણ માં અને વરામવાર જંક ફૂડ ખાવા થી વધુવજન ની સમસ્યા થાય છે.

વધુ વજન ના કારણે ડાયાબિટીસ અને લોહી નું ઊંચું દબાણ જેવી સમસ્યા નો ખતરો વધે છે.

જંક ફૂડ એટલે એવા ખોરાક જે સ્વાસ્થ્ય માટે હાનિકારક હોય અને તેમાં પોષક તત્વો ઓછા હોય. આ પ્રકારના ખોરાકમાં સામાન્ય રીતે વધારે ચરબી, ખાંડ, મીઠું અને કલરી હોય છે, પરંતુ પોષક તત્વ જેવી કે વિટામિન, ખનિજ અને પ્રોટીન ઓછા હોય છે.

ઉદાહરણ તરીકે, ચિપ્સ, કંદ, નૂડલ્સ, સોડા, અને ફાસ્ટ ફૂડને જંક ફૂડ ગણવામાં આવે છે.

તો જન્કફૂડ શું છે? 'જન્ક' શબ્દ નો અર્થ નકામું થાઈ છે. અને તે વાત તો ભાડા જ લોકો ને ખબર છે કે જન્ક ફૂડ ની અંદર ન્યુટ્રિશનલ લાભો કોઈ જ પ્રકાર ના હોતા નથી જેના કારણે તે આપણા સ્વાસ્થ્ય માટે અનહેલ્ધી છે. અને તેના કારણે આપણ ને ઘન બધા સ્વસ્થ્ય ને લગતા રોગો થઇ શકે છે પછી ભલે તમે તેને ક્યારેક જ ખાતા હોવ કે રોજ ખાતા હોવ.

3) જન્ક ફૂડ ના ડિસેડવાન્ટેજયસ વિષે વધુ માહિતી.

1.મેમરી પ્રોબ્લેમ થઇ શકે છે

એક નોંધાયેલા અભ્યાસે દર્શાવ્યું છે કે તંદુરસ્ત લોકોએ પાંચ દિવસથી વધુ સમય માટે જંક ફૂડ ખાય છે, જે મૂડ, ગતિ અને ધ્યાન સામેલ જ્ઞાનાત્મક પરીક્ષણો પર ખરાબ પ્રદર્શન કરે છે. અને પરિણામે, સતત પાંચ દિવસ માટે જંક ફૂડ ખાવું એ તમારી યાદશક્તિને વધુ ખરાબ કરી શકે છે. કારણ કે નબળી આહાર અમુક રાસાયણિક પ્રતિક્રિયાઓનું કારણ બની શકે છે જે મગજમાં બળતરા તરફ દોરી જાય છે, જે મેમરી સાથે સંકળાયેલું છે.

2.ભૂખ નિયંત્રિત કરવા ની ક્ષમતા ને ઘટાડે છે

પ્રોસેસ્ડ ખોરાક અને તળેલા ખોરાકમાં મળતા ટ્રાંસ ચરબીનો ખૂબ જ વપરાશ મગજમાં મિશ્ર સંકેતો મોકલી શકે છે, જેનાથી તમે કેટલી ભૂખ્યા છો અને તમે શું ખાધું છે તે પ્રક્રિયા કરવી મુશ્કેલ બનાવે છે. મગજના યોગ્ય કાર્યવાહી માટે, ઓમેગા -3 અને ઓમેગા -6 જેવી આવશ્યક ફેટી એસિડની દૈનિક માત્રા જરૂરી છે. આ બે ફેટી એસિડ્સની ઊણપથી મગજ સંબંધિત સમસ્યાઓ અને અતિશય આહાર થઈ શકે છે.

3. યાદશક્તિ ઓછી થવી

એક અભ્યાસમાં દર્શાવવામાં આવ્યું છે કે ફેટી એસિડ અને મીઠાઈઓથી વધારે પ્રમાણમાં શરીરમાં ઇન્સ્યુલિન સ્તરમાં વધારો થઈ શકે છે. શરીરમાં ઇન્સ્યુલિનનું સ્તર વધારે છે, મગજ આ હોર્મોનની પ્રતિક્રિયા આપે છે અને તેનાથી પ્રતિરોધક બને છે. આનાથી યાદ

અપાવવાની અથવા વિચારો કરવાની ક્ષમતાને પ્રતિબંધિત કરવામાં આવે છે, આમ ડિમેન્શિયાનું જોખમ ઊભું થાય છે.

4.ડિપ્રેશન

તરફ લઇ જય શકે છે ચરબી અને ખાંડમાં ઊંચા ખોરાકનો વપરાશ મગજના રાસાયણિક પ્રવૃત્તિમાં ફેરફાર કરે છે. આનાથી તાણનો ઉપાય લાગી શકે છે જેમાં તાણનો સામનો કરવામાં અસમર્થતા હોય છે અને તેથી તે તમને નિરાશ કરે છે. ઉપરાંત, જંક ફૂડ્સનો વધુ પડતો ખાવું, તમારા શરીરમાં જરૂરી પોષક તત્વો જેમ કે એમિનો એસિડ ટ્રિપ્ટોફેન ગુમાવશે. આ એમિનો એસિડનો અભાવ ડિપ્રેશનની લાગણીઓમાં વધારો કરી શકે છે.

5. વધુ ને વધુ જંક ફૂડ ખાવાની ઇચ્છા

જંક ફૂડ રિફાઇન્ડ કાર્બોહાઇડ્રેટથી ભરેલો છે, જે તમારા રક્ત ખાંડના સ્તરોને વધે છે. જો તમારું ખાંડનું સ્તર ખૂબ ઓછું હોય, તો તે ચિંતા, થાક અને મૂંઝવણ પેદા કરી શકે છે. જંક ફૂડ્સમાં ચરબી અને ખાંડની ઉચ્ચ સામગ્રી તમને ખૂબ જ ઝડપી ખાય છે અને તમને તમારા ગુસ્સાને સંતોષવા માટે વધુ પડતું બનાવે છે.

6. અપચો

ફાસ્ટ ફૂડ(junk food) અપચો તળેલા હોય છે જેથીખોરાકમાંથી તેલ પેટમાં સંચિત થાય છે, જેના કારણે એસિડિટી થાય છે. મસાલેદાર જંક ફૂડ અપચો કરે છે

7.હૃદય રોગનું જોખમ વધે છે

જંક ફૂડ કોલેસ્ટેરોલ અને ટ્રાઇગ્લિસરાઇડના સ્તરને વધારે છે, જે હૃદય રોગના માટેના મુખ્ય જોખમ પરિબળો છે. જંક ફૂડમાં હાજર ચરબી શરીરમાં સંગ્રહિત થાય છે અને તમને સ્થૂળ બનાવે છે. જેટલું શરીર નું વધારે વજન, તેટલું વધારે હૃદય રોગનું જોખમ.

8.કિડની ના રોગનું કારણ બની શકે છે

ચીપ્સ અને ફાઈસ જેવા જંક ફૂડમાં ઉકળેલા પ્રક્રિયાયુક્ત મીઠુંની ઊંચી માત્રા હોય છે, જે ઉત્સેચકો અને લાળના સ્રાવને વધારે છે જે તમારા ગુસ્સાને વધારે છે. મીઠુંમાંથી સોડિયમ અને ખરાબ ચરબીમાં બ્લડ પ્રેશર વધે છે, જેનાથી કિડની કાર્યને અસર થાય છે.

9.લીવર (યકૃત)ડેમેજ પણ થઇ શકે છે

જંક ફૂડનો બીજો ગેરલાભ એ છે કે તે લીવરને નુકસાન પહોંચાડી શકે છે. જંક ફૂડ્સમાં ટ્રાન્સ ચરબીના ઊંચા સ્તરો હોય છે જે યકૃતમાં ચરબી તરીકે જમા થાય છે, જે ફેટી લીવર રોગ અને યકૃત નિષ્ક્રિયતા નુ કારણ બની શકે છે.

10.કેન્સર નું જોખમ વધારે છે

એક નોંધાયેલા અભ્યાસમાં જાણવા મળ્યું છે કે ખાંડ અને ચરબી vada junk food ખાવાથી કોલોન કેન્સર થવાનું જોખમ વધે છે.

વધુ પ્રમાણ માં અને વરામવાર જંક ફૂડ ખાવા થી વધુવજન ની સમસ્યા થાય છે.

વધુ વજન ના કારણે ડાયાબિટીસ અને લોહી નું ઊંચું દબાણ જેવી સમસ્યા નો ખતરો વધે છે.

જંક ફૂડ માટી મળતી ઉર્જા (કેલરી)

ખાદ્ય પદાર્થ	1 serving	કેલરી
સમોસા	1	200
વેજ સેન્ડવીચ	2	200
પિઝા	1 slice	200
ચોકલેટ	25 g	140
આઈસ્ક્રીમ	½ કપ	200
ઠંડુ પીણું	Bottle(200ml)	150
નૂડલ્સ	1 કપ	219
પેસ્ટ્રી	1	410
વેફર્સ	100 g	100

સ્ત્રોત: ડાયટરી ગાઇડલાઇન ફોર ઈન્ડિયન

7) **શારીરિક પ્રવૃત્તિ અને કસરતનું મહત્વ**

કસરત.....

સ્વસ્થ જીવન તરફનો માર્ગ

કસરત કરવાની સરળ અને સાદી રીતો

૧) ચાલવું
૨) સાયકલ ચલાવવી
૩) જોગીંગ
૪) તરવું
૫) નૃત્ય કરવું
૬) બહારની રમતો રમવી.
૭) બાગકામ જાતે કરવું.
૮) ઘરકામ જાતે કરવું.






કસરત શા માટે ?

૧) કોલેસ્ટેરોલનું પ્રમાણ ઘટાડે છે.
૨) શરીરના વજનને નિયંત્રિત રાખે છે.
૩) ચિંતાને હળવી બનાવવામાં મદદ કરે છે.
૪) રોગ સામેની પ્રતિકારક શક્તિમાં વધારો કરે છે.
૫) બિન-ચેપી રોગોનું જોખમ ઘટાડે છે.

નિયમિત કસરત વ્યકિતને નીરોગી, સુખી અને સમજદાર રાખે છે.

કસરત એ આરોગ્યમય જીવનશૈલીનું મહત્વનું અંગ છે. નિયમિત કસરત કરવાથી શરીર અને માનસિક સ્વાસ્થ્ય બંનેમાં સુધારો થાય છે. કસરતનું મહત્વ નીચે મુજબ છે:

1. શારીરિક આરોગ્યમાં સુધારો:
    - કસરત કરવાથી હૃદયનું આરોગ્ય મજબૂત થાય છે.
    - વજન નિયંત્રણમાં રહે છે અને મેડાની માત્રા ઘટે છે.
    - હાડકાં અને માંસપેશીઓ મજબૂત બને છે.
2. માનસિક તંદુરસ્તી:
    - કસરત ડિપ્રેશન અને ચિંતાને ઘટાડવામાં મદદરૂપ થાય છે.
    - મગજને તાજગી મળે છે અને મનોવૃત્તિમાં સુધારો થાય છે.
    - આત્મવિશ્વાસ વધે છે અને જીવનની ગુણવત્તા સુધરે છે.
3. રોગ પ્રતિકારક શક્તિમાં વધારો:
    - નિયમિત કસરત શરીરના રોગપ્રતિકારક શક્તિને મજબૂત બનાવે છે.
    - ડાયાબિટીસ, હાઈ બ્લડ પ્રેશર અને ઓસ્ટીઓપોરોસિસ જેવા રોગોનો જોખમ ઓછો થાય છે.
4. સુતવાની ગુણવત્તા સુધારે છે:
    - કસરત કરવાથી ઉંઘ સારી થાય છે અને અનિદ્રા જેવી સમસ્યાઓ દૂર થાય છે.

5. દીર્ઘાયુષ્ય માટે જરૂરી:
    - કસરત લાંબુ જીવન જીવવામાં અને શરીર તંદુરસ્ત રાખવામાં મદદ કરે છે.

પુખ્ત વ્યક્તિઓ (ઉંમર 18થી 64 વર્ષ)

તંદુરસ્ત રહેવા માટે 18થી 64 વર્ષની ઉંમરની પુખ્ત વ્યક્તિઓએ રોજ સક્રિય રહેવા માટે પ્રયત્ન કરવો જોઈએ અને નીચેની બાબતો કરવી જોઈએ:

- ઓછામાં ઓછી 150 મિનિટ માટે મધ્યમ પ્રમાણમાં ઍરોબિક પ્રવૃત્તિ જેમ કે દર અઠવાડિયે સાઈક્લિંગ અથવા ઝડપથી ચાલવું, અને
- શક્તિ મેળવવા માટેની કસરતો અઠવાડિયામાં બે કે વધારે દિવસો માટે જે બધા મુખ્ય સ્નાયુઓ માટે કામ કરે છે (પગ, નિતંબ, પીઠ, પેટ, છાતી, ખભા અને બાહુઓ).

વૈકલ્પિક રીતે

- 75 મિનિટ માટે ભારે ઍરોબિક પ્રવૃત્તિ, જેમ કે દોડવું અથવા દર અઠવાડિયે સિંગલ્સ ટેનિસની રમત, અને
- શક્તિ મેળવવા માટેની કસરતો અઠવાડિયામાં બે કે વધારે દિવસો માટે જે બધા મુખ્ય સ્નાયુઓ માટે કામ કરે છે (પગ, નિતંબ, પીઠ, પેટ, છાતી, ખભા અને બાહુઓ).

વૈકલ્પિક રીતે

- દર અઠવાડિયે મધ્યમ અને ભારે ઍરોબિક પ્રવૃત્તિનું મિશ્રણ. દાખલા તરીકે, બે વખત 30 મિનિટ દોડવું વત્તા 30 મિનિટ ઝડપથી ચાલવું એ 150 મિનિટની મધ્યમ ઍરોબિક પ્રવૃત્તિ કરવા બરાબર છે, અને
- શક્તિ મેળવવા માટેની કસરતો અઠવાડિયામાં બે કે વધારે દિવસો માટે જે બધા મુખ્ય સ્નાયુઓ માટે કામ કરે છે (પગ, નિતંબ, પીઠ, પેટ, છાતી, ખભા અને બાહુઓ).

પુખ્ત વ્યક્તિઓ (65 વર્ષથી વધુ ઉંમર)

65 કે તેથી વધુ ઉંમરની પુખ્ત વ્યક્તિઓ જેઓ સામાન્ય રીતે ફિટ હોય અને તેમને એવા કોઈ રોગો ન હોય કે જેના કારણે તેમનું હલનચલન મર્યાદિત બને તેઓએ રોજ સક્રિય રહેવાનો પ્રયત્ન કરવો જોઈએ અને નીચેની બાબતો કરવી જોઈએ:

- ઓછામાં ઓછી 150 મિનિટ માટે મધ્યમ પ્રમાણમાં ઍરોબિક પ્રવૃત્તિ જેમ કે દર અઠવાડિયે સાઇકિલંગ અથવા ચાલવું, અને
- શક્તિ મેળવવા માટેની કસરતો અઠવાડિયામાં બે કે વધારે દિવસો માટે જે બધા મુખ્ય સ્નાયુઓ માટે કામ કરે છે (પગ, નિતંબ, પીઠ, પેટ, છાતી, ખભા અને બાહુઓ).

વૈકલ્પિક રીતે

- 75 મિનિટ માટે ભારે ઍરોબિક પ્રવૃત્તિ, જેમ કે દોડવું અથવા દર અઠવાડિયે સિંગલ્સ ટેનિસની રમત, અને

- શક્તિ મેળવવા માટેની કસરતો અઠવાડિયામાં બે કે વધારે દિવસો માટે જે બધા મુખ્ય સ્નાયુઓ માટે કામ કરે છે (પગ, નિતંબ, પીઠ, પેટ, છાતી, ખભા અને બાહુઓ).

વૈકલ્પિક રીતે

- દર અઠવાડિયે મધ્યમ અને ભારે ઍરોબિક પ્રવૃત્તિનું મિશ્રણ. દાખલા તરીકે, બે વખત 30 મિનિટ , દોડવું વત્તા 30 મિનિટ ઝડપથી ચાલવું એ 150 મિનિટની મધ્યમ ઍરોબિક પ્રવૃત્તિ કરવા બરાબર છે, અને
- શક્તિ મેળવવા માટેની કસરતો અઠવાડિયામાં બે કે વધારે દિવસો માટે જે બધા મુખ્ય સ્નાયુઓ માટે કામ કરે છે (પગ, નિતંબ, પીઠ, પેટ, છાતી, ખભા અને બાહુઓ).

બધી પુખ્ત વ્યક્તિઓએ લાંબા સમય સુધી બેસી રહેવામાં જે સમય વીતે છે તેનો અવધિ ઓછો કરવો જોઈએ.

કસરતના વિવિધ પ્રકારો

માર્ગદર્શિકામાં આપેલી રૂપરેખા પ્રમાણે, ડાયબિટીસનું નિયમન કરવામાં બે પ્રકારની પ્રવૃત્તિઓ અગત્યની છે, તે છે: ઍરોબિક કસરત અને સ્ટ્રેન્થ ટ્રેનિંગ.

એરોબિક કસરત

આ પ્રકારની કસરત તમારા શરીરને ઈન્સ્યુલિનનો વધુ સારી રીતે વપરાશ કરવામાં મદદ કરે છે. તે તમારાં હૃદય અને હાડકાંની શક્તિ વધારવામાં પણ મદદ કરે છે, જે દરમિયાન લોહીમાં પરિભ્રમણ સુધારવામાં અને લોહીમાં ગ્લુકોઝનાં સ્તરો અને રક્તદાબ ઓછાં કરીને તમને હૃદયરોગ થવાનું જોખમ ઓછું કરીને અને તે દરમિયાન કોલેસ્ટેરોલનાં સ્તરોમાં સુધારો કરે છે.

ઍરોબિક પ્રવૃત્તિઓનાં ઉદાહરણો

- ઝડપથી ચાલવું (બહાર અથવા ટ્રેડમિલ પર)
- સાઈક્લિંગ (બહાર અથવા સ્ટેશનરી સાઈક્લિંગ)

- નૃત્ય
- ઍરોબિક્સ
- દાદરા ચડવા
- જૉગિંગ / દોડવું
- મધ્યમથી ભારે બાગકામ

સ્ટ્રેન્થ ટ્રેનિંગ

આ પ્રકારની કસરત પણ તમારા શરીરને ઇન્સ્યુલિન પરત્ત્વે વધુ સંવેદનશીલ બનાવી શકે છે અને લોહીમાં ગ્લુકોઝ ઓછું કરી શકે છે. તે તમને ઓસ્ટિઓપોરોસિસ તથા હાડકાંનાં ફ્રૅક્ચર થવાના જોખમને ઘટાડીને મજબૂત સ્નાયુઓ અને હાડકાં જાળવવામાં મદદ કરે છે. તમારા શરીરમાં સ્નાયુઓ જેટલા વધારે તેટલી તમે કેલરી વધારે બાળશો, પછી ભલે તમારું શરીર પ્રવૃત્તિમાં પરોવાયેલું ન હોય. સ્ટ્રેન્થ ટ્રેનિંગ દ્વારા સ્નાયુનો ક્ષય ટાળવો એ ઉંમર વધવાની સાથે સ્વતંત્ર જીવનશૈલી જાળવવાની ચાવી છે.

સ્ટ્રેન્થ ટ્રેનિંગ પ્રવૃત્તિઓનાં ઉદાહરણો

- વેઇટ મશીનો અથવા ફ્રી વેઇટ્સ
- રેઝિસ્ટન્સ બૅન્ડ
- ભારે વજનો ઊંચકવાં અથવા વસ્તુઓ ઊંચકવી, જેમ કે ડબ્બાબંધ વસ્તુઓ અથવા પાણીની બોટલો
- એવી કસરતો જેમાં સ્નાયુઓ બનાવવા માટે તમારા શરીરના વજનનો ઉપયોગ થાય છે દા.ત. પુશ અપ્સ, સિટ અપ્સ, સ્ક્વૉટ્સ, લન્જિસ, પ્લૅન્ક્સ
- અન્ય પ્રવૃત્તિઓ કે જેનાથી સ્નાયુઓ બને છે અને જળવાય છે


Aerobics Training
Balance Workouts
Strength and Resistance Training
Flexibility

વિવિધ શારીરિક પ્રવૃતિયોથી વપરાતી ઊર્જા(કેલોરિ)

પ્રવૃત્તિ	Kcal/hr.
સાફ સફાઈ	210
બાગકામ	**300**
ટીવી જોવું	**86**
સાયકલિંગ(15km/hr)	**360**
દોડવાનું	
12(km/hr)	**750**
10(km/hr)	**655**
8(km/hr)	**522**
6(km/hr)	**353**
ચાલવાનું	**160**
નૃત્ય	**372**
ખરીદી	**204**
ટાઈપિંગ	**108**
ઊંઘવાથી	**57**
ઉભુરેહવાનું	**132**
બેસવાથી	**86**

સ્ત્રોત : ડાયટરી ગાઈડલાઈન

8)

સોશિયલ મીડિયા ના ફાયદા અને ગેરફાયદા

સાધારણ ભાષામાાં વાત કરાય તો સોશિયલ મીડિયમ એક એવો માધ્યમ છે જે અમે ઈન્ટરનેટની દુનિયા વિશે જણાવે છે.જેમ કે વોટ્સએપ, ફેસબુક, ઇન્સ્ટાગ્રામ, સ્નેપચેટ વગેરે તેના ઉપયોગ ઉપયોગથી તમેતમારી વાત દુનિયા સુધી પોહચાડી પણ શકો છો.

<u>સોશિયલ મીડિયા ના ફાયદા અને ગેરફાયદા</u>

સોશિયલ મીડિયા આજે ખાદ્ય અને પોષણ સાથે સંબંધિત માહિતીને વહેંચવા માટે મહત્વપૂર્ણ પ્લેટફોર્મ બની ગયું છે.

લાભ **(Benefits):**

1. જાગૃતિ અને માહિતી:
    - લોકો માટે પોષણ અને સ્વસ્થ જીવનશૈલી અંગે માહિતી ઉપલબ્ધ બને છે.
    - અલગ-અલગ ડાયટ પ્લાન, રેસિપી અને ખાદ્ય પદાર્થોના પોષણમૂલ્ય અંગેનો વિહંગાવલોકન મળે છે.
2. પ્રેરણા:
    - ફિટનેસ બ્લોગર્સ અને ડાયટિશિયનના વિડિયો અને પોસ્ટ્સ લોકોને પ્રેરિત કરે છે.
    - લોકોએ પોતાનું વજન ઓછું કરવા, મસબૂત શરીર બનાવવા અથવા તંદુરસ્ત જીવનશૈલી અપનાવવા માટે પ્રેરણા મળે છે.
3. નવાં ખોરાકના સંશોધન:
    - નવીન રેસિપીઓ, સસ્તાં અને પોષક વિકલ્પો જાણવા મળે છે.

- શાકાહારી અને વિકેગન ડાયટ વિશે વધુ લોકો જાગૃત થાય છે.

4. સાંસ્કૃતિક ખોરાકનો પ્રસાર:
    - ગુજરાતી ખાદ્યપદાર્થો, જેમ કે થેપલા, ખીચડી અને હાંડવો, સમગ્ર વિશ્વમાં લોકપ્રિય થાય છે.
5. સહજ પ્રાપ્તિ:
    - ઓનલાઇન ડાયટ પલાન અને પોષણ પરામર્શ સરળતાથી ઉપલબ્ધ છે.

નુકસાન (Consequences):

1. ખોટી માહિતી:
    - ખાદ્ય અને પોષણ અંગે ખોટી અથવા અધૂરી માહિતી વહેંચાય છે.
    - કેટલાક ખોરાક "સુપરફૂડ" તરીકે દર્શાવાય છે, જે લોકોમાં ભૂલભુલૈયા પેદા કરે છે.
2. અનુપયોગી વલણ:
    - કેટલીક ડાયટ ટ્રેન્ડ્સ શરીર માટે હાનિકારક હોઈ શકે છે, પણ સોશિયલ મીડિયા પર તેમની વધઘટ થાય છે.
3. લત:
    - ખાવા-પીવાના વિડિયોઝની આદત જમવાનું સમયમર્યાદામાં ખોરવાડી શકે છે.
    - લેઝી અને જંક ફૂડનો પ્રચાર પણ નકારાત્મક પ્રભાવ છોડી શકે છે.
4. તુલના:
    - ફિટનેસ અને ખાદ્ય લાઇફસ્ટાઇલ સાથે સંકળાયેલી પોસ્ટ્સ લોકોમાં તુલનાનું વલણ ઊભું કરે છે, જેનાથી માનસિક તાણ વધે છે.

નિષ્કર્ષ:

સોશિયલ મીડિયા, પોષણ અને ખોરાક ક્ષેત્રે માટે જરૂરી માહિતી પડેછે, પરંતુ તેની સાચી અને વિશ્વસનીય માહિતી સમજદારી પૂર્વક કરવો જોઈએ

ધ ઈટ રાઈટ મુવમેટ

#AajSeThodaKam

આજથી થોડું ઓછું તેલ, ખાંડ
અને મીઠાનો ઓછો ઉપયોગ

તમારા રોજીંદા આહારમાં મીઠું, ખાંડ અને ચરબીનું પ્રમાણ ઘટાડો અને સ્થૂળતા, લોહીનું ઉચું દબાણ, ડાયાબિટીસ, હૃદય રોગ અને બીજા બીન ચેપી રોગોનું જોખમ ઘટાડો.

- **ઘટાડો** — ધીમે ધીમે તમારા રોજીંદા આહારમાં મીઠું, ખાંડ અને તેલનું પ્રમાણ
- **નિયંત્રણ કરો** — દર મહિને મીઠું, ખાંડ અને તેલ ઓછું ખરીદો / માપમાં વાપરો
- **બદલવું** — સ્વાસ્થ્ય વિકલ્પો ખાંડને બદલે ફળો, વનસ્પતિજન્ય ઘી ને બદલે વનસ્પતિજન્ય તેલ
- **માપદંડ રાખો** — નાની ચમચીથી મીઠું, ખાંડ અને તેલને ખોરાકમાં નાખવાં
- **ઓછું કરો** — અથાણાં. ખારા નાસ્તાં, સોસ, જામ, ઠંડા પીણા, મીઠાઈઓ, તળેલાં આહાર
- **ટાળવું**
  - -તેલને વારંવાર ગરમ કરવું અને વાપરવું
  - -કચુંબર, કાપેલાં ફળો, દહીંમાં મીઠું અને ખાંડ નાંખવાં
  - -રોટલી અને ભાત બનાવતી વખતે મીઠું નાંખવું
  - -શુધ્ધ ખાંડ વાપરવી

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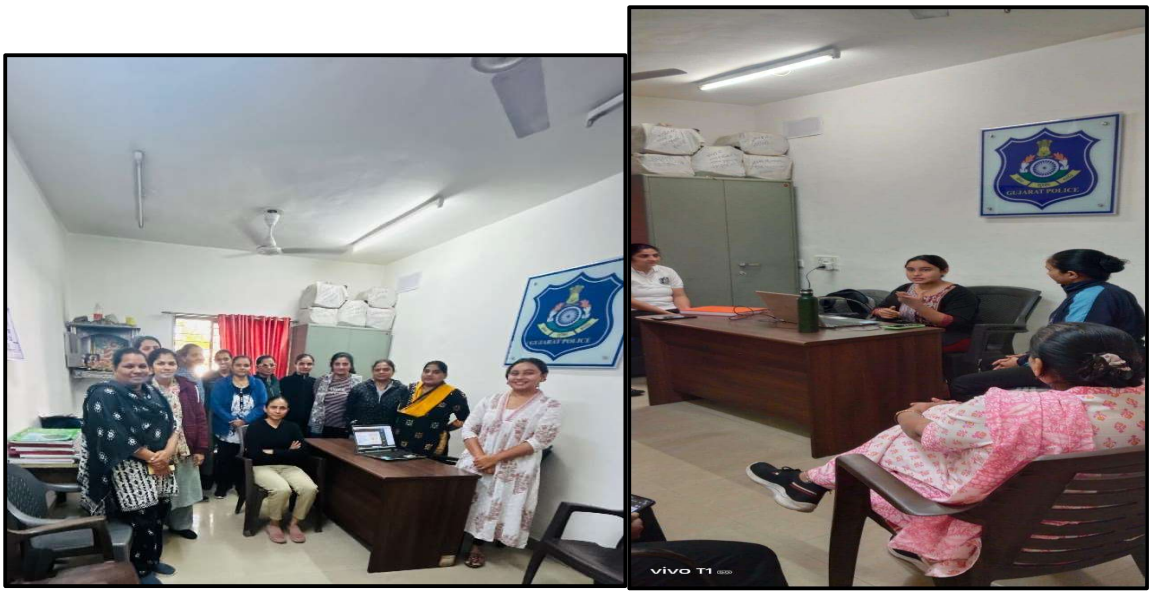
Photo gallery

Data collection &Counselling sessions (hybrid mode)


GUJARAT POLICE
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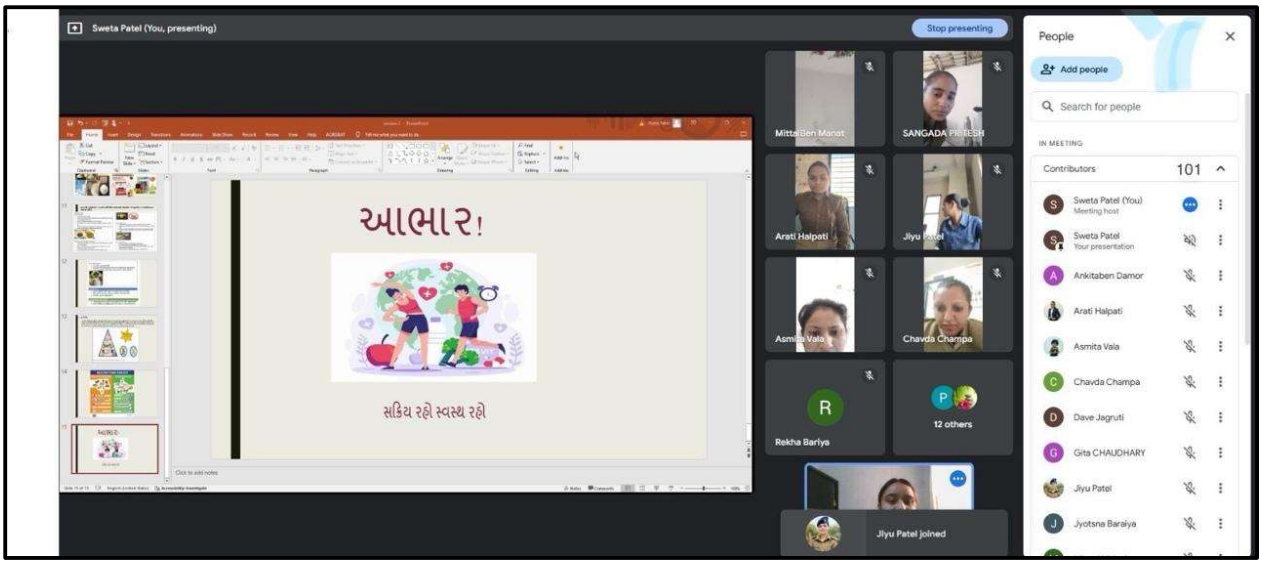
vivo T1


Sweta Patel (You, presenting)
Stop presenting
આભાર!
સક્રિય રહો સ્વસ્થ રહો
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SANGADA PRITESH
Arati Halpati
Jiyu Patel
Asmita Vala
Chavda Champa
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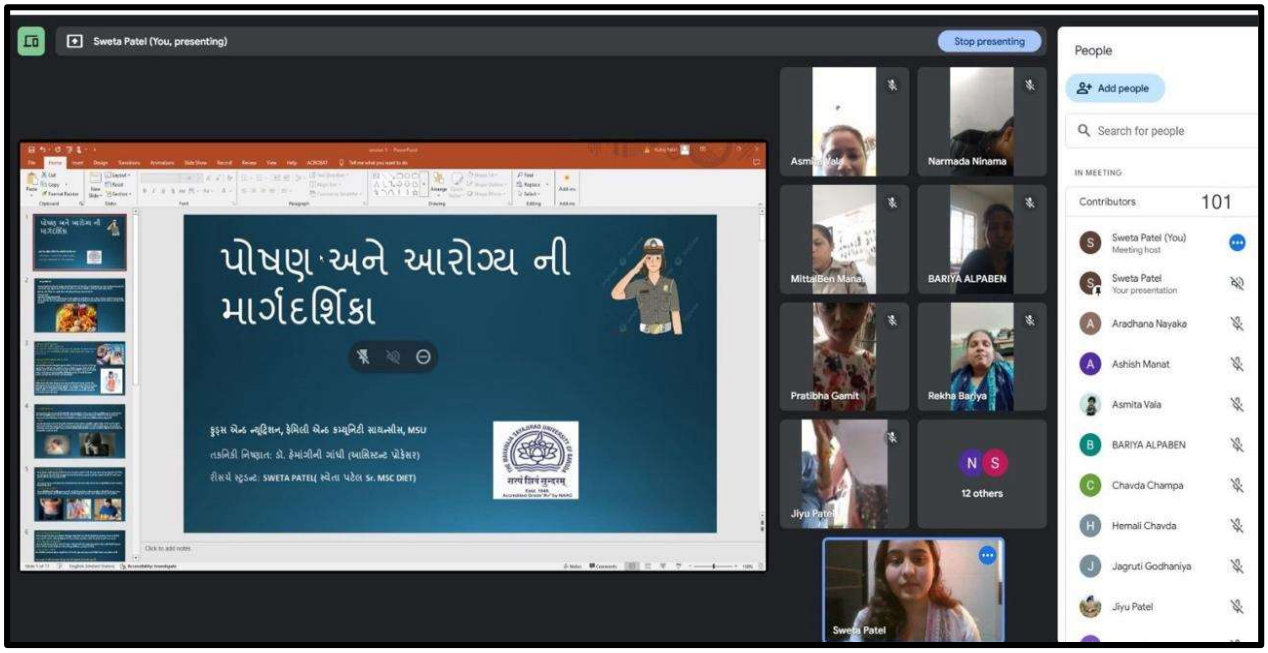
Jyotsna Baraiya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પોષણ અને આરોગ્ય ની માર્ગદર્શિકા
ફૂડ્સ એન્ડ ન્યૂટ્રિશન, ફેમિલી એન્ડ કમ્યુનિટી સાયન્સીસ, MSU
તકનિકી નિષ્ણાત: ડો. હેમાંગીની ગાંધી (આસિસ્ટન્ટ પ્રોફેસર)
રીસર્ચ સ્ટુડન્ટ: SWETA PATEL(સ્વેતા પટેલ Sr. MSC DIET)
Asmita Vala
Narmada Ninama
MittalBen Manat
BARIYA ALPABEN
Pratibha Gamit
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Hemali Chavda
Jagruti Godhaniya
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